This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

TE
F92
CUTTER

WENDT

General Library System
University of Wisconsin-Madison
728 State Street
Madison, WI 53706-1494
U.S.A.

THE ESSENTIAL DATA OF BEVEL GEARING.

A REFERENCE BOOK FOR SHOP AND DRAFTING ROOM.

BEING A COMPILATION OF
UPWARDS OF 70,000 COMPUTED ITEMS,
TOGETHER WITH NUMEROUS DRAWINGS,
TABLES AND EXPLANATORY MATTER,
CALCULATED TO ELIMINATE MUCH OF
THE MATHEMATICAL DRUDGERY.

By EDWARD J. FROST.

FIRST EDITION.

COPYRIGHT, 1905,
BY
EDWARD J. FROST.

105782 TE .F92 6936824
MAY 7 1903

PREFACE.

Those who have had to do with bevel gear cutting on custom work, where the blanks have been sent in "all ready to cut" will doubtless find no difficulty in realizing the motive which prompted the author to work out the ensuing data for publication, in the hope that it would prove helpful to both expert gear maker and the shop man who has occasion only now and then to figure or lay out a pair of bevels.

It seems very apparent that many mechanics do not realize the necessity for at least moderate accuracy in blanking out bevel gears, taking it for granted that the man with the gear cutter will some how be able to make them work all right, regardless of the condition in which they are sent to him.

The hustle of a break-down job may occasionally offer partial apology for inaccuracies in blanking out a pair of bevels, especially when an effort has been made to follow the sizes of broken or worn out gears, but no reason short of ignorance or utter carelessness will suffice for the deplorable condition in which some work reaches the gear cutter.

There seemed to be a necessity for a compilation of this sort to meet the wants of the busy foreman and superintendent as well as the ofttimes overworked draughtsman, quite as much as for the man unfamiliar with trigonometry or the use of formulæ and rules, whose efforts at figuring serve only to leave him in a state of weak-kneed uncertainty.

The range of combinations will be found to cover nearly every need of ordinary practice.

No attempt has been made in this work to give a refinement of accuracy beyond the limits of practice in the shop.

The outside diameters are figured to the nearest hundredth of an inch, for a one-pitch gear, which means a possible error of one two-hundredth of an inch for that pitch, and this would be still more reduced as the pitch became finer.

It is convenient for the mechanic to give him the backing measured from the points of the teeth, rather than from the pitch line as is usually done, and to this end the tables give the projected distance from the points of the teeth to the pitch line, in the column marked backing for one pitch, this distance to be added to the backing as ordinarily used.

Instead of using the customary degrees and minutes to designate the angles, degrees and tenths have been substituted, as the use of minutes is quite confusing to the average mechanic when applied as so many sixtieths of one of the small divisions as found on a protractor or the graduations on the gear cutter. For instance the difference between eight-tenths of a degree and forty-seven minutes is but one minute, and how much easier the former is to use.

The face angle has been taken as that between the face and axis of the gear, as this is believed to be the most convenient one to use.

The diagram showing the application of the tables will enable anyone to substitute the other angle when desired.

The tables have been arranged in the most convenient manner, giving all the data necessary for both the pinion and gear on the same page and line, thus economizing space as well as saving time in looking up information.

The flexible binding for pocket use will readily commend itself to those who have occasion to carry the book about with them.

Every effort has been made to eliminate mistakes, but when it is considered that there are upwards of seventy thousand items in the data, it would not be surprising if some errors had crept in, and the author will appreciate any effort on the part of users of book, to make it correct within the limits laid down.

It is not the purpose of this little work to discuss the theory of gearing, but rather to state facts deduced from theories already demonstrated by others.

For those wishing to follow the study theoretically, we would recommend "A Practical Treatise on Gearing" and "Formulas in Gearing," both published by Brown & Sharpe Manufacturing Co., of Providence, R. I., "A Treatise on Gear Wheels," by George B. Grant, Grant Gear Works, Boston, "Essentials of Gearing," by Gardner C. Anthony, D. C. Heath & Co., Boston.

In the book by George B. Grant will be found suggestions for farther reading on the subject.

Acknowledgment is due and here made of valuable help obtained from the works mentioned, as also from Professor Jones "Machine Design" and numerous trade catalogues, from some of which the preliminary tables in this work have been adapted, but nothing is here appropriated which would not seem from its repeated publication to have become public property.

EDWARD J. FROST.

Jackson, Mich., April, 1905.

RELATIVE SIZES OF TOOTH AT LARGE AND SMALL ENDS.

The pitch cone radius F, of the large end, is to the pitch cone radius f, of the small end of the tooth, as the thickness at the large end is to the thickness of the small end on the pitch line, so that to find the thickness of tooth at the small end we can resort to simple proportion.

Supposing we are to make a pair of bevels 18 into 60 teeth, 4 pitch, with face as wide as is possible to cut with rotary cutters, and we wish to know the thickness of tooth on the pitch line at the small end and also the height of tooth in order to do the calipering at the proper place.

From the proper column in the tables we find the pitch cone radius to be 31.32″ for a one-pitch tooth, which divided by four gives 7.83″.

As one-third of this distance is all we can use, the face of the gears would become 2.61″, and this subtracted from 7.83″ would give 5.22″ as the pitch cone radius for the small end of the tooth.

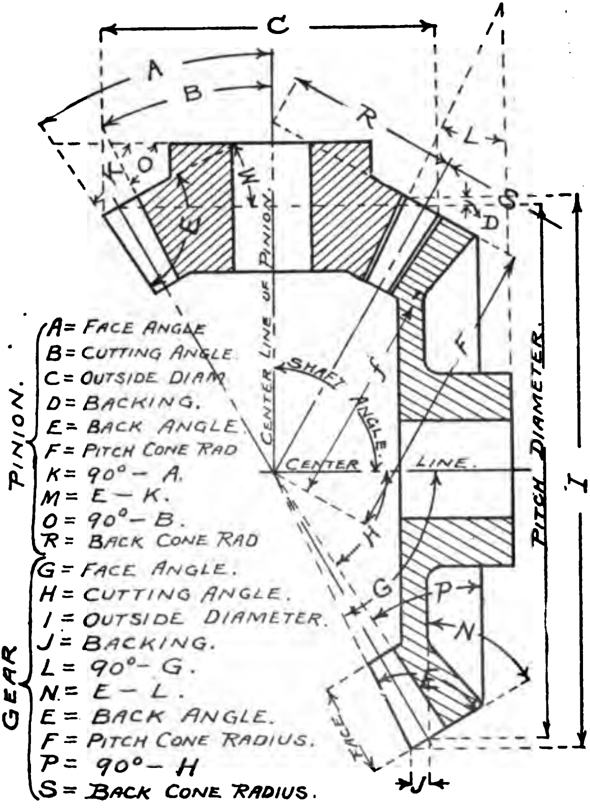
From the table of tooth parts we find that the thickness on pitch line for a four pitch tooth is .392″, and the height or addendum is .250″.

By proportion we have, pitch cone radius F, (7.83″) is to pitch cone radius f, (5.22″) as the thickness of tooth at large end, (.392″) is to the thickness at the small end, and multiplying 5.22 by .392 and dividing by 7.83 we get the thickness at the small end, .261″.

In like manner, 7.83 is to 5.22 as .250 is to the addendum at the small end, or 5.22 times .250 divided by 7.83 gives .166″ as the addendum.

It must be remembered that these figures apply to the thickness of the tooth measured along the curved pitch line, and the height of tooth measured at the center, and must be corrected for use in the calipers as shown by diagram and table elsewhere.

SECTIONAL DIAGRAM OF A PAIR OF BEVEL GEARS, SHOWING APPLICATION OF THE TABLES



TOOTH PARTS.

The table on the opposite page gives the various tooth proportions and is also a conversion table for changing diametral to circular or circular to diametral pitch.

The first column gives the diametral pitch, or the number of teeth to every inch of pitch diameter, the second the circular pitch in inches, measured along the curved pitch circle, (not as a straight line or chord, except for a rack.)

The third gives the thickness of the tooth measured along the curved pitch circle.

The fourth is the addendum or height of the tooth outside of the pitch line, and is given in inches or fractions of an inch.

The fifth gives the whole depth to be cut in a blank and is in terms of inches and fractions of an inch.

This table is a combination of two as ordinarily printed and gives perhaps a better idea of the relative values of the two pitches than would otherwise be obtained.

As the table is intended to be used principally for bevel gears, the fractions have not been carried out as far as is ordinarily done for figuring lengths of racks, where the small fraction, multiplied by a considerable number of teeth produces quite an appreciable error.

DIAMETRAL PITCH. (TEETH PER IN. OF DIA.)	CIRCULAR PITCH. (IN INCHES)	THICKNESS OF TOOTH ON PITCH LINE	ADDENDUM. (IN INCHES)	WHOLE DEPTH OF TOOTH. (IN INCHES.)	DIAMETRAL PITCH. (TEETH PER IN. OF DIA.)	CIRCULAR PITCH. (IN INCHES.)	THICKNESS OF TOOTH ON PITCH LINE	ADDENDUM. (IN INCHES.)	WHOLE DEPTH OF TOOTH (IN INCHES.)
1/2	6.283	3.141	2.000	4.314	4	.785	.392	.250	.539
3/4	4.189	2.094	1.333	2.876	4.189	3/4	.375	.239	.515
1	3.142	1.570	1.000	2.157	4.570	11/16	.343	.219	.472
1 1/4	2.513	1.256	.800	1.726	4.712	2/3	.333	.212	.458
1 1/2	2.094	1.047	.667	1.438	5	.628	.314	.200	.431
1.571	2	1.000	.637	1.373	5.026	5/8	.312	.199	.429
1.675	1 7/8	.937	.597	1.287	5 1/2	.571	.285	.182	.392
1 3/4	1.795	.897	.571	1.233	5.585	9/16	.281	.179	.386
1.795	1 3/4	.875	.557	1.202	6	.524	.261	.167	.359
1.933	1 5/8	.812	.517	1.116	6.283	1/2	.250	.159	.343
2	1.571	.785	.500	1.078	7	.449	.224	.143	.308
2.094	1 1/2	.750	.477	1.030	7.181	7/16	.218	.139	.300
2.185	1 7/16	.718	.458	.987	7.854	2/5	.200	.127	.275
2 1/4	1.396	.698	.444	.959	8	.393	.196	.125	.270
2.285	1 3/8	.687	.438	.944	8.378	3/8	.187	.119	.257
2.394	1 5/16	.656	.418	.901	9	.349	.174	.111	.240
2 1/2	1.257	.628	.400	.863	9.425	1/3	.166	.106	.229
2.513	1 1/4	.625	.398	.858	10	.314	.157	.100	.216
2.646	1 3/16	.593	.378	.816	10.053	5/16	.156	.099	.215
2 3/4	1.142	.571	.364	.784	10.996	2/7	.142	.091	.196
2.792	1 1/8	.562	.358	.772	11	.286	.142	.091	.196
2.957	1 1/16	.531	.338	.729	12	.262	.130	.083	.180
3	1.047	.523	.333	.719	12.566	1/4	.125	.080	.172
3.142	1	.500	.318	.687	13	.242	.120	.077	.166
3.351	15/16	.468	.298	.644	14	.224	.112	.071	.154
3 1/2	.898	.448	.286	.616	14.137	2/9	.111	.071	.153
3.590	7/8	.437	.278	.601	15	.209	.104	.067	.144
3.867	13/16	.406	.259	.558	15.708	1/5	.100	.064	.137

DIAMETRAL PITCH. (TEETH PER IN OF DIA.)	CIRCULAR PITCH. (IN INCHES.)	THICKNESS OF TOOTH ON PITCH LINE.	ADDENDUM. (IN INCHES.)	WHOLE DEPTH OF TOOTH, (IN INCHES.)	DIAMETRAL PITCH. (TEETH PER IN. OF DIA.)	CIRCULAR PITCH. (IN INCHES.)	THICKNESS OF TOOTH ON PITCH LINE.	ADDENDUM. (IN INCHES.)	WHOLE DEPTH OF TOOTH (IN INCHES)
16	.196	.098	.062	.135	60	.052	.026	.016	.036
16.755	$\frac{3}{16}$	.093	.060	.129	62.832	$\frac{1}{20}$	.025	.016	.034
17	.185	.092	.059	.127					
18	.174	.087	.055	.120					
18.850	$\frac{1}{6}$	.083	.053	.114					
19	.165	.082	.053	.113					
20	.157	.078	.050	.108					
21.991	$\frac{1}{7}$	.071	.045	.098					
22	.143	.071	.045	.098					
24	.131	.065	.042	.090					
25.133	$\frac{1}{8}$	.062	.040	.086					
26	.121	.060	.038	.083					
28	.112	.056	.036	.077					
28.274	$\frac{1}{9}$	.055	.035	.076					
30	.105	.052	.033	.072					
31.416	$\frac{1}{10}$	.050	.032	.069					
32	.098	.049	.031	.067					
34	.092	.046	.029	.063					
36	.087	.043	.028	.060					
38	.083	.041	.026	.057					
40	.078	.039	.025	.054					
42	.075	.037	.024	.051					
44	.071	.035	.023	.049					
46	.068	.034	.022	.047					
48	.065	.032	.021	.045					
50	.063	.031	.020	.043					
50.265	$\frac{1}{16}$	.031	.020	.043					
56	.056	.028	.017	038					

DEFINITIONS.

PITCH.

There are two methods of expressing the size of the tooth, one being based on the length of the arc from the center of one tooth to the center of the next, measured along the pitch circle and is called the Circular Pitch, always expressed in units of length, as inches or millimetres.

The other is based on the number of teeth in the circumference to every inch of pitch diameter, and is called Diametral Pitch.

The latter method is very largely preferred, on account of the greater ease with which the computations can be made.

MODULE.

A Module bears the same relation to the pitch diameter, that the circular pitch does to the pitch circumference, and is that fraction of an inch which has one for its numerator, and the diametral pitch for the denominator, the "Addendum" in every case being equal to this fractional part of an inch.

FORM OF TOOTH.

There are two principal forms of tooth curve commonly applied in gearing, known as the "Cycloidal" and the "Involute" systems, the latter being in most general use, especially for cut gears, and will be the only one referred to in this work hereafter.

For farther information regarding tooth forms, see the books referred to in the preface.

CORRECTED ADDENDUM AND CHORDAL THICKNESS OF TOOTH.

In calipering the thickness of the tooth at the pitch line, it must be borne in mind that the distance given in most tables is the length of the arc from outside to outside of tooth, measured on the curved pitch line, while the distance measured by the calipers is a straight line, and allowance should be made for the difference, otherwise in making a pinion of a small number of teeth, the space will be less than the thickness of the meshing tooth, and the gears will run hard, if they will run at all.

In like manner the addendum should be corrected so that the calipering will be done at the proper height from the face line of the gear.

These differences are shown in the accompanying cut, and a table of corrections is given as a substitute for the figures given in the conversion table.

The values given are for the differing numbers of teeth, on a basis of a one-pitch tooth, and in every instance should be divided by the pitch in which you are working.

When making corrections at the small end of the tooth, it will be necessary to find the pitch, which can be done by dividing the pitch cone radius F, for the large end by the pitch cone radius f, for the small end, which in the example given elsewhere would be 7.83 divided by 5.22 giving 1.5 as the ratio of f to F, and this times 4, the diametral pitch at the large end, gives 6 as the diametral pitch at the small end.

By dividing the figures given in the table of corrected addendum and chordal thickness of tooth, by the pitch, the proper figures would be obtained for use in measuring.

DIAGRAM OF TOOTH PARTS

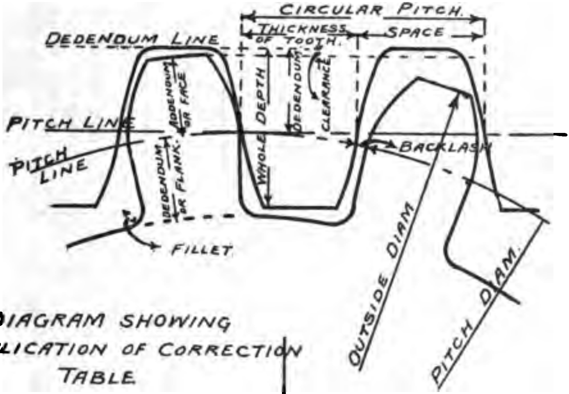


DIAGRAM SHOWING APPLICATION OF CORRECTION TABLE.

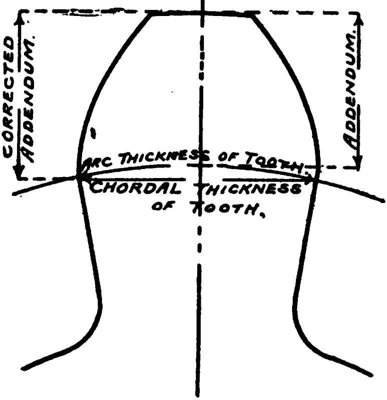


TABLE OF CORRECTED ADDENDUM AND CHORDAL THICKNESS OF TOOTH, FOR ONE DIAMETRAL PITCH.

No. OF CUTTER.	No. OF TEETH.	CORRECTED THICKNESS OF TOOTH. (DIVIDE BY THE PITCH)	CORRECTED ADDENDUM. (DIVIDE BY THE PITCH.)	No. OF CUTTER	No. OF TEETH.	CORRECTED THICKNESS OF TOOTH. (DIVIDE BY THE PITCH.)	CORRECTED ADDENDUM. (DIVIDE BY THE PITCH.)
8	9	1.563	1.068	3	35	1.570	1.018
	10	1.564	1.062		36	1.570	1.017
	11	1.565	1.056		38	1.570	1.016
	12	1.566	1.051		40	1.570	1.015
	13	1.567	1.047		42	1.570	1.015
7	14	1.567	1.044		44	1.570	1.014
	15	1.568	1.041		46	1.570	1.013
	16	1.569	1.038		48	1.570	1.013
6	17	1.569	1.036		50	1.571	1.012
	18	1.569	1.034		52	1.571	1.012
	19	1.569	1.032		54	1.571	1.011
	20	1.569	1.031	2	56	1.571	1.011
5	21	1.569	1.029		58	1.571	1.011
	22	1.569	1.028		60	1.571	1.010
	23	1.570	1.027		62	1.571	1.010
	24	1.570	1.025		66	1.571	1.009
	25	1.570	1.024		70	1.571	1.009
4	26	1.570	1.024		75	1.571	1.008
	27	1.570	1.024		80	1.571	1.008
	28	1.570	1.022		85	1.571	1.007
	29	1.570	1.021		90	1.571	1.007
	30	1.570	1.020		100	1.571	1.006
	31	1.570	1.020		110	1.571	1.005
	32	1.570	1.019		120	1.571	1.005
	33	1.570	1.019	1	135	1.571	1.005
	34	1.570	1.018		RACK.	1.570	1.000

METHODS OF CUTTING.

By inspection of the Sectional Diagram, it will be seen that the teeth grow smaller as they approach the intersecting axes of the two gears, and from this we may infer that it is impossible to cut a perfect bevel with a rotary cutter, as with a curve right for the large end it could not be right for the small end.

A theoretically perfect bevel geer tooth can be cut on a specially constructed planer, where the cutting tool moves in straight lines passing through the intersection of the axes of the gears and is guided for the tooth shape by a hardened steel former placed in the right relative position to give the proper size to the large end of the tooth.

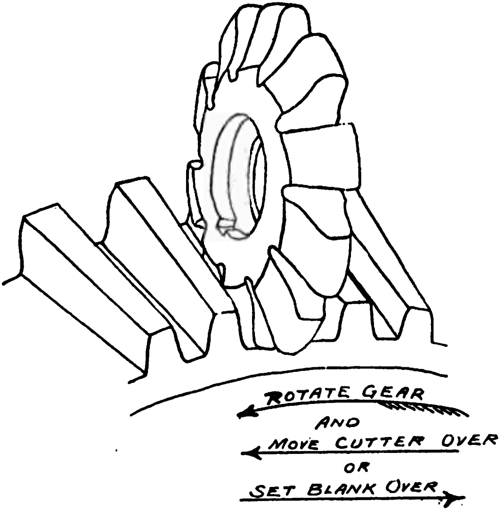
When a rotary cutter is used, as is usually the case with the smaller pitches up to four or three, the form of the tooth produced is very nearly correct for the large end, but as the apex is approached the cutter is withdrawn to such an extent that the form of the tooth is entirely changed.

This change of form will be found to produce a tooth whose sides are too straight and filing will have to be resorted to, using the large end as a guide to round off the small end.

The standard bevel gear cutters are made thinner than those for spurs, so that a gear may be cut whose face does not exceed one-third of the pitch cone radius, without producing parallel sides to the teeth.

This in turn makes it necessary to take at least two cuts to produce the proper space, and three cuts are often taken, the first being a central one from which the remaining proper amount to remove can be estimated.

After having taken the first or central cut, it will be found that there remains more metal to be removed at the large end than at the small, and this necessitates moving the cutter over out of the center of the gear, and following it up with the tooth being c


ROTATE GEAR
AND
MOVE CUTTER OVER
OR
SET BLANK OVER

by rotating the blank. If on a milling machine, instead of moving the cutter, the blank may be set over by means of the indexed cross feed screw and the blank rotated in the opposite direction.

No definite rule can be laid down for these movements, as it is largely a matter of cut and try, the rapidity and accuracy of the work depending in large measure upon the skill and judgment of the operator.

Brown & Sharpe Mfg. Co., in their "Practical Treatise on Gearing" give as a trial distance to set out of center about one-tenth to one-eighth of the thickness of the teeth at the large end, one-tenth being about right for a twelve-tooth pinion, and from that to one-eighth in a twenty-four tooth gear and larger.

The two methods of rotating the blank and setting over are clearly shown in the cut on the following page.

As a matter of fact B. & S. standard cutters are made a trifle thinner than will just go through the small end of the tooth when the face is one-third of pitch cone radius, the amount allowed being as follows for the various pitches:

40 pitch and finer,	.003″
12 to 39 pitch,	.005″
8 to 11 "	.008″
6 to 7 "	.010″
5 pitch,	.012″
4 "	.015″
3 "	.020″
2 "	.025″

It will be noticed that the cutting angle as given in the tables produces a root line running toward the intersection of the axes, and not cutting proportionately deeper at the small end as given by Brown & Sharpe.

The method here employed necessitates a little more filing at the small end, but produces a shorter and stronger tooth.

THE USE OF THE TABLES.

The use of the tables and other data can best be shown by direct application to a problem which might easily occur in daily practice.

Suppose that we have to make a pair of bevels, 18 into 60 teeth, 4 pitch, 1½″ back of the pitch line to the end of the hubs on both gears, and that we wish to have the face as wide as is possible to cut with a rotary cutter.

In the tables all angles read direct, while dimensions have to be divided by the pitch worked in, so we would have,

Pinion.—

Face angle, 18.5 degrees.
Cutting angle, 14.6 "
Outside diam. 19.92 ÷ 4 = 4.98″.
Backing, (measured from points of teeth)
equals 1½″ plus (.28″ ÷ 4)
equals 1.57″.
B. & S. std. bevel cutter No. 6.
Back angle, 88.2 degrees.
Greatest width of face, 31.32″ divided by
4 and then by 3 equals 2.61″.

Gear.—

Face angle, 75.1 degrees.
Cutting angle, 71.2 "
Outside diam., 60.57″ divided by 4 = 15.142″.
Backing, (measured from points of teeth)
1½″ plus (.96″ ÷ 4) = 1.74″.
B. & S. std. bevel cutter No. 1.
Back angle, 88.2 degrees.

9 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
9	54.0	34.5	10.41	70	8	81.0	6.36					
10	50.5	32.1	10.49	.67	8	81.5	6.73	56.5	38.3	11.34	.74	7
11	47.4	29.9	10.55	.63		82.0	7.11	58.8	41.5	12.26	.77	6
12	44.5	28.0	10.60	.60	USE Nº 8 CUTTER AND FILE POINTS OF TEETH, OR CUT WITH SPECIAL CUTTER.	82.4	7.50	60.8	444	13.20	.80	6
13	42.0	26.3	10.65	.55		82.8	7.90	62.5	47.0	14.10	.82	5
14	39.6	24.8	10.68	.53		83.1	8.32	64.1	49.3	15.06	.84	4
15	37.5	23.4	10.72	.50		83.5	8.74	65.6	51.5	16.00	.86	4
16	35.6	22.1	10.74	.49		83.8	9.18	66.9	53.4	16.98	.86	4
17	33.9	21.0	10.75	.46		84.1	9.61	68.0	55.2	17.92	.87	3
18	32.3	20.0	10.77	.44		84.3	10.05	69.1	56.9	18.88	.88	3
19	30.8	19.0	10.79	.42		84.6	10.51	70.1	58.3	19.84	.89	3
20	29.5	18.2	10.81	.40		84.8	10.96	71.0	59.7	20.80	.90	3
21	28.2	17.4	10.83	.39		85.0	11.42	71.8	61.0	21.78	.91	2
22	27.1	16.7	10.84	.38		85.2	11.88	72.6	62.2	22.76	.92	2
23	26.0	16.0	10.86	.35		854	12.34	73.3	63.3	23.70	.93	2
24	25.0	15.3	10.87	.34		85.5	12.80	73.9	64.3	24.68	.93	2
25	24.1	14.8	10.88	.33		85.7	13.27	74.5	65.2	25.66	.94	2
26	23.3	14.2	10.89	.31		85.8	13.75	75.1	66.1	26.63	.94	2
27	22.5	13.8	10.90	.30		86.0	14.23	75.6	66.9	27.60	.95	2
28	21.7	13.3	10.90	.29		86.1	14.71	76.1	67.7	28.58	.95	2
29	21.0	12.8	10.91	.28		86.2	15.18	76.6	68.4	29.56	.95	2
30	20.4	12.4	10.91	.27		86.3	15.66	77.0	69.1	30.54	.95	2
31	19.7	12.0	10.92	.26		86.5	16.14	77.4	69.7	31.52	.96	2
32	19.1	11.7	10.92	.25		86.5	16.62	77.8	70.3	32.50	.96	2
33	18.6	11.3	10.93	.23		86.7	17.10	78.1	70.9	33.47	.96	2
34	18.1	11.0	10.93	.22		86.7	17.58	78.4	71.4	34.44	.96	1
35	17.6	10.8	10.94	.22		86.8	18.07	78.8	71.9	35.44	.97	1
36	17.1	10.5	10.94	.22		86.9	18.55	79.1	72.4	36.44	.97	1
37	16.7	10.2	10.94	.22		87.0	19.04	79.4	72.9	37.44	.97	1
38	16.2	9.9	10.95	22		87.1	19.53	79.6	73.3	38.44	.97	

	PINION					PINION AND GEAR		GEAR				
9 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
39	15.8	9.7	10.95	.22	USE Nº 8 CUTTER & FILE THE POINTS OF TEETH OR CUT WITH SPECIAL CUTTER.	87.1	20.01	79.9	73.7	39.45	.97	1
40	15.5	9.5	10.95	.22		87.2	20.50	80.1	74.1	40.44	.97	1
41	15.1	9.2	10.95	.21		87.3	20.99	80.3	74.5	41.43	.97	1
42	14.8	9.0	10.95	.21		87.3	21.47	80.6	74.8	42.42	.97	1
43	14.4	8.8	10.96	.20		87.4	21.95	80.8	75.2	43.41	.98	1
44	14.1	8.6	10.96	.20		87.4	22.45	81.0	75.5	44.40	.98	1
45	13.8	8.4	10.96	.19		87.5	22.94	81.2	75.8	45.39	.98	1
46	13.5	8.2	10.96	.19		87.5	23.43	81.4	76.1	46.39	.98	1
47	13.2	8.1	10.96	.19		87.6	23.92	81.6	76.4	47.38	.98	1
48	13.0	7.9	10.96	.18		87.6	24.40	81.8	76.7	48.37	.98	1
49	12.7	7.7	10.96	.18		87.7	24.88	81.9	77.0	49.36	.98	1
50	12.5	7.6	10.97	.18		87.7	25.39	82.1	77.2	50.36	.98	1
51	12.2	7.4	10.97	.17		87.8	25.88	82.2	77.5	51.35	.98	1
52	12.0	7.3	10.97	.17		87.8	26.37	82.4	77.7	52.34	.98	1
53	11.8	7.2	10.97	.17		87.9	26.86	82.5	77.9	53.34	.98	1
54	11.6	7.0	10.97	.16		87.9	27.35	82.7	78.1	54.33	.98	1
55	11.4	6.9	10.97	.16		87.9	27.85	82.8	78.3	55.33	.98	1
56	11.1	6.8	10.97	.16		88.0	28.34	82.9	78.5	56.32	.98	1
57	10.9	6.7	10.97	.16		88.0	28.83	83.0	78.7	57.32	.98	1
58	10.7	6.5	10.98	.15		88.0	29.33	83.1	78.9	58.31	.99	1
59	10.6	6.4	10.98	.15		88.1	29.82	83.2	79.1	59.31	.99	1
60	10.4	6.3	10.98	.15		88.1	30.32	83.4	79.3	60.30	.99	1
61	10.2	6.2	10.98	.15		88.1	30.81	83.5	79.5	61.30	.99	1
62	10.1	6.1	10.98	.14		88.2	31.30	83.6	79.6	62.29	.99	1
63	9.9	6.0	10.98	.14		88.2	31.80	83.7	79.8	63.29	.99	1
64	9.8	5.9	10.98	.14		88.2	32.30	83.8	80.0	64.28	.99	1
65	9.6	5.8	10.98	.14		88.2	32.79	83.9	80.1	65.28	.99	1
66	9.5	5.8	10.98	.13		88.3	33.29	84.0	80.3	66.27	.99	1
67	9.3	5.7	10.98	.13		88.3	33.78	84.1	80.4	67.27	.99	1
68	9.2	5.6	10.98	.13		88.3	34.27	84.2	80.5	68.27	.99	1

PINION						PINION AND GEAR		GEAR				
9 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
69	9.1	5.5	10.98	.13	USE № 8 CUTTER & FILE POINTS OF TEETH, OR CUT WITH SPECIAL CUTTER.	88.3	34.79	84.2	80.7	69.26	.99	1
70	8.9	5.5	10.98	.13		88.4	35.27	84.3	80.9	70.26	.99	1
71	8.7	5.4	10.98	.12		88.4	35.78	84.4	81.0	71.25	.99	1
72	8.6	5.3	10.98	.12		88.4	36.28	84.5	81.1	72.25	.99	1
73	8.5	5.2	10.98	.12		88.4	36.78	84.6	81.2	73.25	.99	1
74	8.4	5.1	10.98	.12		88.5	37.27	84.6	81.4	74.24	.99	1
75	8.3	5.1	10.98	.12		88.5	37.77	84.7	81.5	75.24	.99	1
76	8.2	5.0	10.99	.12		88.5	38.27	84.8	81.6	76.24	.99	1
77	8.1	5.0	10.99	.11		88.5	38.76	84.9	81.7	77.23	.99	1
78	8.0	4.9	10.99	.11		88.5	39.26	84.9	81.8	78.23	.99	1
79	7.9	4.8	10.99	.11		88.6	39.76	85.0	81.9	79.23	.99	1
80	7.8	4.8	10.99	.11		88.6	40.25	85.0	82.0	80.23	.99	1
81	7.7	4.7	10.99	.11		88.6	40.75	85.1	82.1	81.22	.99	1
82	7.6	4.7	10.99	.11		88.6	41.25	85.2	82.2	82.22	.99	1
83	7.5	4.6	10.99	.11		88.6	41.74	85.2	82.3	83.22	.99	1
84	7.4	4.5	10.99	.11		88.6	42.24	85.3	82.4	84.22	.99	1
85	7.3	4.5	10.99	.10		88.7	42.74	85.3	82.5	85.21	.99	1
86	7.2	4.4	10.99	.10		88.7	43.23	85.4	82.5	86.21	.99	1
87	7.1	4.4	10.99	.10		88.7	43.73	85.4	82.6	87.21	.99	1
88	7.1	4.3	10.99	.10		88.7	44.23	85.5	82.7	88.21	.99	1
89	7.0	4.3	10.99	.10		88.7	44.73	85.5	82.8	89.20	.99	1
90	6.9	4.2	10.99	.10		88.7	45.22	85.6	82.9	90.20	.99	1
91	6.9	4.2	10.99	.10		88.7	45.72	85.6	83.0	91.20	.99	1
92	6.8	4.1	10.99	.10		88.8	46.22	85.7	83.0	92.20	.99	1
93	6.7	4.1	10.99	.09		88.8	46.72	85.7	83.1	93.19	.99	1
94	6.6	4.1	10.99	.09		88.8	47.22	85.8	83.2	94.19	.99	1
95	6.6	4.0	10.99	.09		88.8	47.71	85.8	83.2	95.19	.99	1
96	6.5	4.0	10.99	.09		88.8	48.21	85.9	83.3	96.19	.99	1
97	6.4	3.9	10.99	.09		88.8	48.71	85.9	83.4	97.19	.99	1
98	6.4	3.9	10.99	.09		88.8	49.21	85.9	83.5	98.19	.99	1

9 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIV'DE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
99	6.3	3.9	10.99	.09	USE Nº 8 CUTTER AND FILE POINTS OF THE TEETH OR CUT WITH SPECIAL CUTTER.	88.8	49.70	86.0	83.5	99.18	.99	1
100	6.2	3.8	10.99	.09		88.8	50.20	86.0	83.6	100.18	.99	1
101	6.2	3.8	10.99	.09		88.9	50.70	86.0	83.6	101.18	.99	1
102	6.1	3.7	10.99	.09		88.9	51.20	86.1	83.7	102.18	.99	1
103	6.1	3.7	10.99	.08		88.9	51.70	86.1	83.8	103.17	.99	1
104	6.0	3.7	10.99	.08		88.9	52.19	86.2	83.8	104.17	.99	1
105	6.0	3.6	10.99	.08		88.9	52.69	86.2	83.9	105.17	.99	1
106	5.9	3.6	10.99	.08		88.9	53.19	86.2	83.9	106.17	.99	1
107	5.8	3.6	10.99	.08		88.9	53.69	86.3	84.0	107.17	.99	1
108	5.8	3.5	10.99	.08		88.9	54.19	86.3	84.0	108.17	.99	1
109	5.7	3.5	10.99	.08		88.9	54.69	86.3	84.1	109.16	.99	1
110	5.7	3.5	10.99	.08		89.0	55.18	86.4	84.2	110.16	.99	1
111	5.6	3.4	10.99	.08		89.0	55.68	86.4	84.2	111.16	.99	1
112	5.6	3.4	10.99	.08		89.0	56.18	86.5	84.3	112.16	.99	1
113	5.5	3.4	10.99	.08		89.0	56.68	86.5	84.3	113.16	.99	1
114	5.5	3.3	10.99	.08		89.0	57.18	86.5	84.4	114.16	.99	1
115	5.4	3.3	10.99	.08		89.0	57.68	86.5	84.4	115.16	.99	1
116	5.4	3.3	10.99	.07		89.0	58.17	86.6	84.5	116.15	.99	1
117	5.3	3.3	10.99	.07		89.0	58.67	86.6	84.5	117.15	.99	1
118	5.3	3.2	10.99	.07		89.0	59.17	86.6	84.6	118.15	.99	1
119	5.2	3.2	10.99	.07		89.0	59.67	86.7	84.6	119.15	.99	1
120	5.2	3.2	10.99	.07		89.0	60.17	86.7	84.6	120.15	.99	1
121	5.2	3.1	10.99	.07		89.1	60.67	86.7	84.7	121.15	.99	1
122	5.1	3.1	10.99	.07		89.1	61.17	86.8	84.7	122.15	.99	1
123	5.1	3.1	10.99	.07		89.1	61.66	86.8	84.8	123.14	.99	1
124	5.1	3.1	10.99	.07		89.1	62.16	86.8	84.8	124.14	.99	1
125	5.0	3.0	10.99	.07		89.1	62.66	86.8	84.9	125.14	.99	1
126	5.0	3.0	10.99	.07		89.1	63.16	86.9	84.9	126.14	.99	1
127	5.0	3.0	10.99	.07		89.1	63.66	86.9	85.0	127.14	.99	1
128	4.9	3.0	10.99	.07		89.1	64.16	86.9	85.0	128.14	.99	1

9 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
129	4.9	3.0	10.99	07	N° 8 or SPECIAL	89.1	64.66	86.9	85.0	129.14	.99	1
130	4.8	2.9	10.99	.07		89.1	65.16	86.9	85.0	130.14	.99	1
131	4.8	2.9	10.99	.07		89.1	65.65	87.0	85.1	131.14	.99	1
132	4.8	2.9	10.99	.07		89.1	66.15	87.0	85.1	132.14	.99	1

PINION						PINION AND GEAR		GEAR				
9 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIV'DE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE. ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
99	6.3	3.9	10.99	.09	USE Nº 8 CUTTER AND FILE POINTS OF THE TEETH OR CUT WITH SPECIAL CUTTER.	88.8	49.70	86.0	83.5	99.18	.99	1
100	6.2	3.8	10.99	.09		88.8	50.20	86.0	83.6	100.18	.99	1
101	6.2	3.8	10.99	.09		88.9	50.70	86.0	83.6	101.18	.99	1
102	6.1	3.7	10.99	.09		88.9	51.20	86.1	83.7	102.18	.99	1
103	6.1	3.7	10.99	.08		88.9	51.70	86.1	83.8	103.17	.99	1
104	6.0	3.7	10.99	.08		88.9	52.19	86.2	83.8	104.17	.99	1
105	6.0	3.6	10.99	.08		88.9	52.69	86.2	83.9	105.17	.99	1
106	5.9	3.6	10.99	.08		88.9	53.19	86.2	83.9	106.17	.99	1
107	5.8	3.6	10.99	.08		88.9	53.69	86.3	84.0	107.17	.99	1
108	5.8	3.5	10.99	.08		88.9	54.19	86.3	84.0	108.17	.99	1
109	5.7	3.5	10.99	.08		88.9	54.69	86.3	84.1	109.16	.99	1
110	5.7	3.5	10.99	.08		89.0	55.18	86.4	84.2	110.16	.99	1
111	5.6	3.4	10.99	.08		89.0	55.68	86.4	84.2	111.16	.99	1
112	5.6	3.4	10.99	.08		89.0	56.18	86.5	84.3	112.16	.99	1
113	5.5	3.4	10.99	.08		89.0	56.68	86.5	84.3	113.16	.99	1
114	5.5	3.3	10.99	.08		89.0	57.18	86.5	84.4	114.16	.99	1
115	5.4	3.3	10.99	.08		89.0	57.68	86.5	84.4	115.16	.99	1
116	5.4	3.3	10.99	.07		89.0	58.17	86.6	84.5	116.15	.99	1
117	5.3	3.3	10.99	.07		89.0	58.67	86.6	84.5	117.15	.99	1
118	5.3	3.2	10.99	.07		89.0	59.17	86.6	84.6	118.15	.99	1
119	5.2	3.2	10.99	.07		89.0	59.67	86.7	84.6	119.15	.99	1
120	5.2	3.2	10.99	.07		89.0	60.17	86.7	84.6	120.15	.99	1
121	5.2	3.1	10.99	.07		89.1	60.67	86.7	84.7	121.15	.99	1
122	5.1	3.1	10.99	.07		89.1	61.17	86.8	84.7	122.15	.99	1
123	5.1	3.1	10.99	.07		89.1	61.66	86.8	84.8	123.14	.99	1
124	5.1	3.1	10.99	.07		89.1	62.16	86.8	84.8	124.14	.99	1
125	5.0	3.0	10.99	.07		89.1	62.66	86.8	84.9	125.14	.99	1
126	5.0	3.0	10.99	.07		89.1	63.16	86.9	84.9	126.14	.99	1
127	5.0	3.0	10.99	.07		89.1	63.66	86.9	85.0	127.14	.99	1
128	4.9	3.0	10.99	.07		89.1	64.16	86.9	85.0	128.14	.99	1

	PINION					PINION AND GEAR		GEAR				
9 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
129	4.9	3.0	10.99	07	No 8 or SPECIAL	89.1	64.66	86.9	85.0	129.14	.99	1
130	4.8	2.9	10.99	.07		89.1	65.16	86.9	85.0	130.14	.99	1
131	4.8	2.9	10.99	.07		89.1	65.65	87.0	85.1	131.14	.99	1
132	4.8	2.9	10.99	.07		89.1	66.15	87.0	85.1	132.14	.99	1

	PINION					PINION AND GEAR		GEAR				
10 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
10	53.1	35.7	11.41	.70	USE Nº8 CUTTER AND FILE POINTS OF THE TEETH OR CUT WITH SPECIAL CUTTER.	81.9	7.07	53.1	35.7	11.41	.70	7
11	50.0	33.4	11.48	.67		82.3	7.43	55.4	38.8	12.34	.74	7
12	47.2	31.3	11.54	.64		82.7	7.81	57.5	41.7	13.28	.77	6
13	44.5	29.5	11.59	.61		83.0	8.20	59.4	443	1422	.79	5
14	42.2	27.8	11.63	.58		83.4	8.60	61.1	46.8	1516	.81	5
15	40.1	26.3	11.67	.55		83.7	901	62.7	49.0	16.11	.83	4
16	38.1	25.0	11.70	.53		84.0	943	64.1	51.0	17.06	.85	4
17	36.3	23.7	11.73	.50		842	9.86	65.3	528	18.01	.86	4
18	34.6	22.6	11.75	.48		84.4	10.29	66.5	54.5	18.97	.87	3
19	33.1	21.6	11.77	.46		84.7	10.74	67.6	560	19.93	.88	3
20	31.7	20.6	11.79	.44		84.9	11.18	68.6	57.5	20.89	.89	3
21	30.4	19.7	11.81	.43		85.1	11.63	69.5	58.8	21.86	.90	3
22	29.2	18.9	11.82	.41		85.3	12.08	70.3	60.1	22.83	.91	2
23	28.1	18.2	11.84	.40		85.4	12.54	71.1	61.2	23.80	.92	2
24	27.0	17.5	11.85	.38		85.6	13.00	71.8	62.3	24.77	.92	2
25	26.1	16.9	11.86	.37		85.7	13.46	72.5	63.3	25.74	.93	2
26	25.2	16.2	11.87	.36		85.9	13.93	73.1	64.2	26.72	.93	2
27	24.3	15.7	11.88	.34		86.0	14.40	73.7	65.1	27.69	.94	2
28	23.5	15.2	11.88	.33		86.1	14.87	74.2	65.9	28.67	.94	2
29	22.8	14.7	11.89	.32		86.3	15.34	74.8	66.7	29.65	.94	2
30	22.1	14.2	11.90	.31		86.4	15.81	75.2	67.4	30.63	.95	2
31	21.4	13.8	11.90	.30		86.5	16.29	75.7	68.0	31.61	.95	2
32	20.8	13.3	11.91	.29		86.6	16.76	76.1	68.7	32.59	.95	2
33	20.2	13.0	11.91	.29		86.7	17.24	76.5	69.3	33.58	.95	2
34	19.6	12.6	11.92	.28		86.8	17.72	76.9	69.9	34.56	.96	2
35	19.0	12.3	11.92	.27		86.8	18.20	77.2	70.5	35.55	.96	2
36	18.6	12.0	11.93	.27		86.9	18.68	77.5	71.0	36.54	.96	1
37	18.1	11.6	11.93	.26		87.0	19.16	77.9	71.4	37.52	.96	1
38	17.6	11.3	11.93	.25		87.1	19.65	78.2	71.9	38.51	.96	1
39	17.2	11.1	11.94	.25		87.2	20.13	78.5	72.3	39.50	.97	1

10 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
40	16.8	10.8	11.94	.24	USE No 8 CUTTER AND FILE POINTS OF THE TEETH OR CUT WITH SPECIAL CUTTER.	87.2	20.61	78.8	72.8	40.48	97	1
41	16.4	10.5	11.94	.23		87.3	21.10	79.0	73.2	41.47	.97	1
42	16.0	10.3	11.95	.23		87.3	21.59	79.3	73.5	42.46	97	1
43	15.7	10.1	11.95	.22		87.4	22.07	79.5	73.9	43.45	.97	1
44	15.3	9.9	11.95	.22		87.5	22.56	79.7	74.3	44.44	97	1
45	15.0	9.6	11.95	.21		87.5	23.05	80.0	74.6	45.43	.97	1
46	14.7	9.4	11.95	.21		87.6	23.54	80.2	74.9	46.43	.97	1
47	14.4	9.2	11.96	.21		87.6	24.03	80.4	75.2	47.42	.98	1
48	14.1	9.0	11.96	.20		87.7	24.51	80.6	75.5	48.41	.98	1
49	13.8	8.9	11.96	.20		87.7	25.01	80.8	75.8	49.40	.98	1
50	13.5	8.7	11.96	.19		87.7	25.49	81.0	76.1	50.39	.98	1
51	13.3	8.5	11.96	.19		87.8	25.98	81.1	76.4	51.38	98	1
52	13.0	8.3	11.96	.19		87.8	26.48	81.3	76.6	52.38	98	1
53	12.8	8.2	11.96	.18		87.9	26.97	81.5	76.9	53.37	.98	1
54	12.6	8.0	11.97	.18		87.9	27.46	81.6	77.1	54.36	.98	1
55	12.3	7.9	11.97	.18		87.9	27.95	81.8	77.3	55.36	.98	1
56	12.1	7.8	11.97	.18		88.0	28.44	81.9	77.6	56.36	.98	1
57	11.9	7.6	11.97	.17		88.0	28.93	82.0	77.8	57.35	.98	1
58	11.7	7.5	11.97	.17		88.0	29.43	82.2	78.0	58.34	.98	1
59	11.5	7.4	11.97	.16		88.1	29.92	82.3	78.2	59.33	.98	1
60	11.4	7.3	11.97	.16		88.1	30.41	82.4	78.4	60.33	.98	1
61	11.2	7.1	11.97	.16		88.1	30.91	82.6	78.5	61.32	.98	1
62	11.0	7.0	11.97	.16		88.2	31.40	82.7	78.7	62.32	.98	1
63	10.8	6.9	11.97	.15		88.2	31.89	82.8	78.9	63.31	.98	1
64	10.6	6.8	11.97	.15		88.2	32.39	82.9	79.1	64.31	.98	1
65	10.5	6.7	11.98	.15		88.3	32.88	83.0	79.3	65.30	.99	1
66	10.3	6.6	11.98	.15		88.3	33.38	83.1	79.4	66.30	.99	1
67	10.2	6.5	11.98	.15		88.3	33.87	83.2	79.6	67.30	.99	1
68	10.0	6.4	11.98	.14		88.3	34.36	83.3	79.7	68.29	99	1
69	9.9	6.3	11.98	.14		88.3	34.86	83.4	79.9	69.29	99	1

PINION						PINION AND GEAR		GEAR				
10 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
70	9.7	6.2	11.98	.14	USE Nº 8 CUTTER AND FILE POINTS OF THE TEETH, OR CUT WITH SPECIAL CUTTER.	88.4	35.35	83.5	80.1	70.28	.99	1
71	9.5	6.2	11.98	.14		88.4	35.85	83.6	80.2	71.28	.99	1
72	9.4	6.1	11.98	.14		88.4	36.34	83.7	80.3	72.28	.99	1
73	9.3	6.0	11.98	.13		88.4	36.84	83.8	80.5	73.27	.99	1
74	9.2	5.9	11.98	.13		88.5	37.34	83.9	80.6	74.27	.99	1
75	9.0	5.8	11.98	.13		88.5	37.83	84.0	80.7	75.27	.99	1
76	8.9	5.7	11.98	.13		88.5	38.33	84.0	80.8	76.26	.99	1
77	8.8	5.7	11.98	.13		88.5	38.82	84.1	80.9	77.26	.99	1
78	8.7	5.6	11.98	.13		88.5	39.32	84.2	81.1	78.26	.99	1
79	8.6	5.5	11.98	.12		88.6	39.81	84.3	81.2	79.25	.99	1
80	8.5	5.5	11.98	.12		88.6	40.31	84.3	81.3	80.25	.99	1
81	8.4	5.4	11.98	.12		88.6	40.81	84.4	81.4	81.25	.99	1
82	8.3	5.3	11.98	.12		88.6	41.30	84.5	81.5	82.24	.99	1
83	8.2	5.3	11.98	.12		88.6	41.80	84.5	81.6	83.24	.99	1
84	8.1	5.2	11.99	.12		88.6	42.30	84.6	81.7	84.24	.99	1
85	8.0	5.1	11.99	.12		88.7	42.79	84.6	81.8	85.24	.99	1
86	7.9	5.1	11.99	.11		88.7	43.29	84.7	81.9	86.23	.99	1
87	7.8	5.0	11.99	.11		88.7	43.79	84.8	82.0	87.23	.99	1
88	7.7	5.0	11.99	.11		88.7	44.28	84.8	82.1	88.23	.99	1
89	7.6	4.9	11.99	.11		88.7	44.78	84.9	82.2	89.23	.99	1
90	7.5	4.9	11.99	.11		88.7	45.28	85.0	82.2	90.22	.99	1
91	7.5	4.8	11.99	.11		88.7	45.77	85.0	82.3	91.22	.99	1
92	7.4	4.8	11.99	.11		88.8	46.27	85.0	82.4	92.22	.99	1
93	7.3	4.7	11.99	.11		88.8	46.77	85.1	82.5	93.22	.99	1
94	7.2	4.7	11.99	.10		88.8	47.27	85.1	82.6	94.21	.99	1
95	7.1	4.6	11.99	.10		88.8	47.76	85.2	82.6	95.21	.99	1
96	7.1	4.5	11.99	.10		88.8	48.26	85.2	82.7	96.21	.99	1
97	7.0	4.5	11.99	.10		88.8	48.76	85.3	82.8	97.20	.99	1
98	6.9	4.5	11.99	.10		88.8	49.25	85.3	82.9	98.20	.99	1
99	6.9	4.4	11.99	.10		88.8	49.75	85.4	82.9	99.20	.99	1

10 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
100	6.8	4.4	11.99	.10	USE Nº8 CUTTER AND FILE POINTS OF THE TEETH, OR CUT WITH SPECIAL CUTTER.	88.9	50.25	85.4	83.0	100.20	.99	1
101	6.8	4.3	11.99	.10		88.9	50.75	85.5	83.1	101.20	.99	1
102	6.7	4.3	11.99	.10		88.9	51.24	85.5	83.1	102.20	.99	1
103	6.6	4.3	11.99	.10		88.9	51.74	85.6	83.2	103.19	.99	1
104	6.6	4.2	11.99	.10		88.9	52.24	85.6	83.3	104.19	.99	1
105	6.5	4.2	11.99	.09		88.9	52.74	85.7	83.3	105.19	.99	1
106	6.4	4.1	11.99	.09		88.9	53.23	85.7	83.4	106.19	.99	1
107	6.4	4.1	11.99	.09		88.9	53.73	85.7	83.4	107.19	.99	1
108	6.3	4.0	11.99	.09		88.9	54.23	85.8	83.5	108.18	.99	1
109	6.3	4.0	11.99	.09		88.9	54.73	85.8	83.5	109.18	.99	1
110	6.2	4.0	11.99	.09		89.0	55.23	85.9	83.6	110.18	.99	1
111	6.1	3.9	11.99	.09		89.0	55.72	85.9	83.7	111.18	.99	1
112	6.1	3.9	11.99	.09		89.0	56.22	85.9	83.7	112.18	.99	1
113	6.0	3.9	11.99	.08		89.0	56.72	86.0	83.8	113.17	.99	1
114	6.0	3.8	11.99	.08		89.0	57.22	86.0	83.8	114.17	.99	1
115	5.9	3.8	11.99	.08		89.0	57.72	86.0	83.9	115.17	.99	1
116	5.9	3.8	11.99	.08		89.0	58.21	86.0	84.0	116.17	.99	1
117	5.8	3.7	11.99	.08		89.0	58.71	86.1	84.0	117.17	.99	1
118	5.8	3.7	11.99	.08		89.0	59.21	86.1	84.1	118.17	.99	1
119	5.7	3.7	11.99	.08		89.0	59.71	86.2	84.1	119.17	.99	1
120	5.7	3.7	11.99	.08		89.0	60.21	86.2	84.2	120.17	.99	1
121	5.6	3.6	11.99	.08		89.1	60.71	86.2	84.2	121.16	.99	1
122	5.6	3.6	11.99	.08		89.1	61.20	86.3	84.3	122.16	.99	1
123	5.5	3.6	11.99	.08		89.1	61.70	86.3	84.3	123.16	.99	1
124	5.5	3.5	11.99	.08		89.1	62.20	86.3	84.3	124.16	.99	1
125	5.5	3.5	11.99	.08		89.1	62.70	86.3	84.4	125.16	.99	1
126	5.4	3.5	11.99	.08		89.1	63.20	86.4	84.4	126.16	.99	1
127	5.4	3.4	11.99	.08		89.1	63.69	86.4	84.5	127.16	.99	1
128	5.3	3.4	11.99	.07		89.1	64.19	86.4	84.5	128.15	.99	1
129	5.3	3.4	11.99	.07		89.1	64.69	86.5	84.6	129.15	.99	1

10 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
130	5.2	3.4	11.99	.07	No 8 or SPECIAL	89.1	65.19	86.5	84.6	130.15	.99	1
131	5.2	3.3	11 99	.07		89.1	65.69	86.5	84.7	131.15	.99	1
132	5.2	3.3	11.99	.07		89.1	66.19	86.5	84.7	132.15	.99	1

11	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
11	52.4	36.4	12.41	.70	7	82.7	7 78					
12	49.5	34.3	12.47	.67	7	83.0	8.14	54 6	39 4	13.35	.23	6
13	46.9	32.4	12.53	.64	7	83.3	8.51	56.5	42 0	14.29	.26	6
14	44.6	30.7	12 57	.61	8	83.6	8 90	58 3	44 4	15.23	.28	5
15	42.4	29.1	12 61	.59	8	83.9	9 30	59 9	46 6	16 18	.30	4
16	40.4	27 6	12 65	.56	8	84.1	9 71	61 4	48.7	17 13	.32	4
17	38.6	26 3	12.68	.54	8	84 3	10 12	62 8	50.6	18 09	.34	4
18	36.9	25.1	12.71	.52	8	84 6	10 55	64 0	52 3	19.04	.35	3
19	35.3	24 0	12.73	.50	8	84 8	10 98	65 2	53 9	20.00	.36	3
20	33 8	23.0	12.75	.48	8	85.0	11.41	66 2	55 4	20.96	.37	3
21	32.5	22.0	12.77	.45	8	85.2	11.85	67 2	56 8	21.93	.38	3
22	31.2	21.2	12.79	.44	8	85.3	12.30	68 1	58 0	22 89	39	3
23	30.1	20.3	12.80	.43	8	85.5	12.75	68 9	59.2	23.86	.40	2
24	29.0	19.6	12.82	.41	8	85.7	13.20	69 7	60.4	24 83	.41	2
25	28.0	18.9	12 83	.40		85 8	13.66	70.5	61.4	25.81	.41	2
26	27.0	18.2	12 84	.39	USE Nº 8 AND FILE OR SPECIAL CUTTER.	85.9	14 11	71 1	62.4	26.78	.42	2
27	26.1	17.6	12.85	.37		86.1	14 58	71.8	63 3	27 75	.42	2
28	25.2	17.0	12.86	.36		86.2	15.04	72.4	64.1	28.73	.43	2
29	24.5	16.5	12.87	.35		86 3	15 51	73.0	65.0	29.71	.43	2
30	23.7	16.0	12 88	.34		86.4	15.98	73.5	65.7	30 69	.44	2
31	23.0	15.5	12 89	.33		86.5	16.45	74 0	66.4	31.67	.44	2
32	22.4	15.0	12.89	.32		86 6	16 92	74 5	67 1	32 65	.44	2
33	21.7	14.6	12.90	.31		86.7	17 39	74 9	67.8	33.63	.45	2
34	21.2	14 2	12.90	.30		86.8	17 87	75 3	68.3	34.61	.45	2
35	20.6	13.8	12.91	.30		86 9	18.34	75.7	69.0	35.60	.45	2
36	20.0	13.6	12.91	.29		87.0	18.82	76.0	69 5	36.58	.45	2
37	19.5	13.1	12.92	.28		87.0	19.30	76.4	70.0	37 57	.46	2
38	19.0	12.8	12.92	.28		87.1	19.78	76.8	70.5	38.56	.46	1
39	18.6	12.5	12.93	.27		87.2	20.26	77.1	71.0	39.54	.46	1
40	18.1	12.2	12.93	.26		87.2	20.74	77.4	71.4	40.53	.46	1

11 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
41	17.7	11.9	12.93	.26	USE Nº 8 CUTTER AND FILE POINTS OF THE TEETH, OR CUT WITH SPECIAL CUTTER.	87.3	21.22	77.7	71.9	41.52	.96	1
42	17.3	11.6	12.93	.25		87.4	2171	78.0	72.3	42.51	.96	1
43	169	11.4	12 94	.25		87.4	22.19	78.2	72.7	43.50	.97	1
44	16.6	11.1	12 94	.24		87.5	22.68	78.5	73.1	44.49	.97	1
45	16.2	10.9	12 94	.24		87.5	23.16	78.7	73.4	45.48	.97	1
46	15.9	10.6	12.94	.23		87.6	23.65	79.0	73.8	46.47	.97	1
47	15.5	10.4	12 95	.23		87.6	2413	79 2	74.1	47.46	.97	1
48	15.2	10.2	12.95	.22		87.7	24 62	79.4	74.4	48.45	.97	1
49	14.9	10.0	12.95	.22		87 7	25.11	79.6	74.7	49.44	.97	1
50	14.6	9.8	12.95	.21		87.8	25.60	79.8	75.0	50.43	.97	1
51	144	9 6	12.95	.21		87.8	26 09	80.0	75.3	51.42	.97	1
52	14.1	9.4	12.96	.20		87.8	26.57	80.2	75.6	52.41	.98	1
53	13.9	9.3	12.96	.20		87.9	27.06	80.4	75.8	53.41	.98	1
54	13.6	9.1	12.96	.20		87.9	27.55	80.6	76.1	54.40	.98	1
55	13.3	9.0	12 96	.19		88.0	28.04	80.7	76.3	55.39	.98	1
56	13.1	8.8	12.96	.19		88.0	28.53	80.9	76.6	56.38	98	1
57	12.9	8.6	12.96	.19		88.0	29.03	81.1	76.8	57.38	.98	1
58	12.7	8.5	12.96	.18		88.1	29.52	81.2	77.1	58.37	.98	1
59	12.5	8.3	12.97	.18		88.1	30.01	81.4	77.3	59.37	.98	1
60	12.3	8.2	12.97	.18		88.1	30.50	81.5	77.5	60.36	.98	1
61	12.1	8.1	12.97	.17		88.1	30.99	81.6	77.7	61.35	.98	1
62	11.9	7.9	12.97	.17		88.2	31.48	81.8	77.8	62.35	.98	1
63	11.7	7.8	12.97	.17		88.2	31.98	81.9	78.0	63.34	.98	1
64	11.5	77	12.97	.17		882	32.47	82.0	78.2	64.34	.98	1
65	11.3	7.6	12.97	.16		88.3	32.96	82.2	78.4	65.33	.98	1
66	11.2	7.5	12.97	.16		88.3	33.45	82.3	78.6	66.33	.98	1
67	11.0	7.4	12.97	.16		88.3	33.95	82.4	78.7	67.33	.98	1
68	10.9	73	12.97	.16		88.3	34.44	82.5	78.9	68.32	.98	1
69	10.7	7.1	12.97	.15		88.4	34.93	82.6	79.0	69.31	.98	1
70	10.5	7.1	12.98	15		88.4	35.43	82.7	79.3	70.31	.99	1

11

11 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
71	10.3	6.9	12.98	.15	USE Nº8 CUTTER AND FILE POINTS OF THE TEETH, OR CUT WITH SPECIAL CUTTER.	88.4	35.92	82.8	79.5	71.31	.99	1
72	10.2	6.8	12.98	.15		88.4	36.42	82.9	79.6	72.30	.99	1
73	10.0	6.7	12.98	.15		88.4	36.91	83.0	79.7	73.30	.99	1
74	9.9	6.7	12.98	.14		88.5	37.41	83.1	79.9	74.29	.99	1
75	9.8	6.6	12.98	.14		88.5	37.90	83.2	80.0	75.29	.99	1
76	9.7	6.5	12.98	.14		88.5	38.40	83.3	80.1	76.29	.99	1
77	9.5	6.4	12.98	.14		88.5	38.89	83.4	80.2	77.28	.99	1
78	9.4	6.3	12.98	.14		88.5	39.39	83.5	80.4	78.28	.99	1
79	9.3	6.2	12.98	.14		88.6	39.88	83.5	80.5	79.28	.99	1
80	9.2	6.2	12.98	.13		88.6	40.38	83.6	80.6	80.27	.99	1
81	9.1	6.1	12.98	.13		88.6	40.87	83.7	80.7	81.27	.99	1
82	8.9	6.0	12.98	.13		88.6	41.37	83.8	80.8	82.27	.99	1
83	8.8	5.9	12.98	.13		88.6	41.86	83.9	80.9	83.26	.99	1
84	8.7	5.9	12.98	.13		88.6	42.36	83.9	81.0	84.26	.99	1
85	8.6	5.8	12.98	.13		88.7	42.85	84.0	81.2	85.26	.99	1
86	8.5	5.7	12.98	.12		88.7	43.35	84.1	81.3	86.25	.99	1
87	8.4	5.7	12.98	.12		88.7	43.85	84.1	81.4	87.25	.99	1
88	8.3	5.6	12.98	.12		88.7	44.34	84.2	81.5	88.25	.99	1
89	8.3	5.5	12.98	.12		88.7	44.84	84.3	81.5	89.24	.99	1
90	8.2	5.5	12.99	.12		88.7	45.33	84.3	81.7	90.24	.99	1
91	8.1	5.4	12.99	.12		88.7	45.83	84.4	81.8	91.24	.99	1
92	8.0	5.4	12.99	.12		88.8	46.33	84.5	81.8	92.24	.99	1
93	7.9	5.3	12.99	.12		88.2	46.82	84.5	81.9	93.24	.99	1
94	7.8	5.2	12.99	.12		88.8	47.32	84.6	82.0	94.23	.99	1
95	7.7	5.2	12.99	.11		88.8	47.82	84.6	82.1	95.23	.99	1
96	7.6	5.1	12.99	.11		88.8	48.31	84.7	82.2	96.23	.99	1
97	7.6	5.1	12.99	.11		88.8	48.81	84.7	82.2	97.23	.99	1
98	7.5	5.0	12.99	.11		88.8	49.31	84.8	82.3	98.22	.99	1
99	7.4	5.0	12.99	.11		88.8	49.80	84.9	82.4	99.22	.99	1
100	7.4	4.9	12.99	.11		88.9	50.30	84.9	82.5	100.22	.99	1

11

PINION						PINION AND GEAR		GEAR				
11 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
101	7.3	4.9	12.99	.11	USE Nº8 CUTTER AND FILE POINTS OF THE TEETH, OR CUT WITH SPECIAL CUTTER.	88.9	50.80	85.0	82.5	101.22	.99	1
102	7.2	4.8	12.99	.11		88 9	51.30	85 0	82.6	102 22	.99	1
103	7.2	4.8	12.99	10		88.9	51.79	85.0	82.7	103.21	.99	1
104	7.1	4.7	12.99	.10		88.9	52.29	85.1	82.8	104.21	.99	1
105	7.0	4.7	12.99	.10		88.9	52.79	85.1	82 8	105.21	.99	1
106	7.0	4.7	12.99	.10		88.9	53.28	85 2	82 9	106.21	.99	1
107	6.9	4.6	12 99	.10		88.9	53.78	85.2	83 0	107.21	.99	1
108	6 8	4.6	12.99	.10		88.9	54.28	85.3	83.0	108 20	.99	1
109	6.8	4.5	12.99	.10		88.9	54.78	85.3	83 1	109.20	.99	1
110	6.7	4.5	12.99	.10		89.0	55.27	85.4	83.1	110.20	.99	1
111	6.6	4.4	12.99	.10		89.0	55.77	85.4	83.2	111.20	.99	1
112	6.6	4.4	12.99	.10		89.0	56.27	85.4	83.2	112.20	.99	1
113	6.5	4.4	12.99	.09		89.0	56.77	85.5	88.3	113.19	.99	1
114	6.5	4.3	12.99	.09		89.0	57.26	85.5	83.4	114.19	.99	1
115	6 4	4.3	12.99	.09		89.0	57 76	85.6	83.4	115.19	.99	1
116	6.3	4.3	12.99	.09		89.0	58 26	85.6	83.5	116.19	.99	1
117	6.3	4.2	12.99	.09		89 0	58.76	85.6	83.5	117.19	.99	1
118	6.2	4.2	12.99	.09		89.0	59 26	85.7	83.6	118.18	.99	1
119	6.2	4.2	12.99	.09		89.0	59 75	85.7	83.7	119.18	.99	1
120	6.1	4.1	12.99	.09		89.0	60 25	85 8	83.7	120 18	.99	1
121	6.1	4.1	12.99	.09		89.1	60 75	85.8	83.8	121.18	.99	1
122	6.0	4.1	12 99	.09		89.1	61 25	85.8	83.8	122 18	.99	1
123	6.0	4 0	12.99	.09		89.1	61 75	85 9	83.9	123.18	.99	1
124	5.9	4.0	12.99	.09		89.1	62 24	85.9	83.9	124.18	99	1
125	5.9	4.0	12.99	.08		89.1	62.74	85 9	84.0	125.17	.99	1
126	5.8	3.9	12.99	.08		89.1	63.24	86.0	84.0	126 17	.99	1
127	5.8	3.9	12.99	.08		89.1	63 74	86.0	84 1	127 17	.99	1
128	5.8	3.9	12.99	.08		89.1	64.23	86.0	84.1	128.17	.99	1
129	5.7	3.8	12.99	.08		89 1	64 73	86.0	84 2	129 17	.99	1
130	5.7	3.8	12.99	.08		89.1	65.22	86.1	84.2	129.17	.99	1

PINION						PINION AND GEAR		GEAR				
11 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
131	5.6	3.8	12.99	.08	No 8 or SPECIAL	89.1	65.72	86.1	84.2	131.17	.99	
132	5.6	3.7	12.99	.08		89.1	66.22	86.1	84.3	132.17	.99	

12 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
12	51.8	372	13.41	.70	6	83.3	849					
13	49.2	35.2	13.47	.67	7	83.5	8.85	53.7	39.8	14.35	.73	6
14	46.9	33.4	13.52	.65	7	83.8	9.22	55.6	42.2	15.30	76	5
15	44.6	31.8	13.56	.62	7	83.0	9.60	57.3	44.4	16.25	.78	5
16	42.6	30.2	13.60	.60	7	84.3	10.00	58.8	46.5	17.20	.80	4
17	40.7	28.8	13.64	.57	7	84.5	10.40	60.3	48.4	18.15	.82	4
18	39.0	27.5	13.67	.55	7	84.7	10.82	61.6	50.2	19.11	.83	4
19	37.4	264	13.69	.53	7	84.9	11.24	62.8	51.8	20.07	.84	3
20	35.9	25.3	13.72	.51	8	85.1	11.66	63.9	53.3	21.03	.86	3
21	34.5	24.2	13.74	.49	8	85.3	12.09	65.0	54.8	21.99	.87	3
22	33.2	23.3	13.76	.48	8	854	12.53	66.0	56.1	22.96	.88	3
23	32.0	22.4	13.77	.46	8	85.6	12.97	66.9	57.3	23.92	.88	3
24	30.9	21.6	13.79	.44	8	85.7	13.42	67.7	58.5	24.89	.89	2
25	29.8	20.9	13.80	.43	8	85.9	13.87	68.5	59.6	25.87	.90	2
26	28.8	20.1	13.82	.42	8	86.0	14.32	69.2	60.6	26.84	.91	2
27	27.8	19.5	13.83	.40	8	86.1	1477	69.4	61.5	27.81	.91	2
28	27.0	18.8	13.84	.39	8	86.2	15.23	70.6	62.4	28.79	.92	2
29	26.2	18.2	13.85	.38	8	86.3	15.69	71.2	63.3	29.77	.92	2
30	25.4	17.7	13.86	.37	8	86.5	16.15	71.8	64.1	30.74	.93	2
31	24.6	17.2	13.87	.36	8	86.6	16.62	72.3	64.8	31.72	.93	2
32	23.9	16.7	13.87	.35	8	86.6	17.09	72.8	65.5	32.70	.93	2
33	23.3	16.2	13.88	.34	8	86.7	17.56	73.3	66.2	32.68	.94	2
34	22.6	15.8	13.89	.33	8	86.8	18.03	73.7	66.9	34.67	.94	2
35	22.0	15.3	13.89	.32	8	86.9	18.50	74.2	67.5	35.65	.94	2
36	21.5	15.0	13.90	.31	8	87.0	18.97	74.6	68.1	36.63	.95	2
37	20.9	14.6	13.90	.31	8	87.0	19.45	75.0	68.7	37.62	.95	2
38	20.4	14.2	13.91	.30	8	87.1	19.92	75.4	69.2	38.60	.95	2
39	19.9	13.8	13.91	.29	8	87.2	20.40	75.7	69.7	39.59	.95	2
40	19.4	13.5	13.92	.28	8	87.2	20.88	76.0	70.2	40.57	.96	1
41	19.0	13.2	13.92	.28	8	87.3	21.36	76.4	70.6	41.56	.96	1

	PINION					PINION AND GEAR		GEAR				
12 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
42	18.6	12.9	13.92	.27	8	87.4	21.84	76.7	71.0	42.55	.96	1
43	18.2	12.6	13.93	.27	8	87.4	22.32	77.0	71.5	43.54	.96	1
44	17.8	12.3	13.93	.26	8	87.5	22.80	77.3	71.9	44.53	.96	1
45	17.4	12.1	13.93	.25	8	87.5	23.29	77.5	72.3	45.51	.96	1
46	17.0	11.8	13.93	.25	8	87.6	23.77	77.8	72.6	46.50	.96	1
47	16.7	11.6	13.94	.24	8	87.6	24.25	78.1	73.0	47.49	.97	1
48	16.3	11.3	13.94	.24	8	87.7	24.74	78.3	73.3	48.48	.97	1
49	16.0	11.1	13.94	.24	8	87.7	25.22	78.5	73.7	49.48	.97	1
50	15.7	10.9	13.94	.23	8	87.8	25.71	78.7	73.9	50.47	.97	1
51	15.4	10.7	13.95	.23	8	87.8	26.20	79.0	74.3	51.46	.97	1
52	15.1	10.5	13.95	.22	8	87.8	26.68	79.2	74.6	52.45	.97	1
53	14.9	10.3	13.95	.22	8	87.9	27.17	79.4	74.8	53.44	.97	1
54	14.6	10.1	13.95	.21	8	87.9	27.66	79.6	75.1	54.43	.97	1
55	14.3	9.9	13.95	.21	8	88.0	28.15	79.7	75.4	55.43	.97	1
56	14.1	9.8	13.96	.21	8	88.0	28.63	79.9	75.6	56.42	.98	1
57	13.8	9.6	13.96	.20	8	88.0	29.12	80.1	75.9	57.41	.98	1
58	13.6	9.4	13.96	.20	8	88.1	29.61	80.3	76.1	58.41	.98	1
59	13.4	9.3	13.96	.20	8	88.1	30.10	80.4	76.3	59.40	.98	1
60	13.2	9.1	13.96	.19	8	88.1	30.59	80.6	76.5	60.39	.98	1
61	13.0	9.0	13.96	.19	8	88.1	31.08	80.7	76.8	61.38	.98	1
62	12.8	8.8	13.96	.19	8	88.2	31.57	80.9	77.0	62.38	.98	1
63	12.5	8.7	13.96	.18	8	88.2	32.07	81.0	77.2	63.37	.98	1
64	12.3	8.6	13.97	.18	8	88.2	32.56	81.2	77.4	64.37	.98	1
65	12.2	8.4	13.97	.18	8	88.3	33.05	81.3	77.6	65.36	.98	1
66	12.0	8.3	13.97	.18	8	88.3	33.54	81.4	77.7	66.36	.98	1
67	11.8	8.2	13.97	.17	8	88.3	34.03	81.5	77.9	67.35	.98	1
68	11.7	8.1	13.97	.17	8	88.3	34.52	81.7	78.1	68.35	.98	1
69	11.5	8.0	13.97	.17	8	88.4	35.02	81.8	78.3	69.35	.98	1
70	11.3	7.8	13.97	.17	8	88.4	35.51	81.9	78.5	70.34	.98	1
71	11.1	7.7	13.97	.17	8	88.4	36.00	82.0	78.6	71.34	.98	1

12 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY. PITCH	NO. OF CUTTER TO USE
72	11.0	7.6	13.97	.16	8	88.4	36.50	82.1	78.8	72.33	.98	1
73	108	7.5	13.97	.16	8	88.4	36.99	82.2	79.0	73.33	.98	1
74	10.7	7.4	13.97	.16	8	88.5	37.48	82.3	79.1	74.32	.98	1
75	10.5	7.3	13.97	.16	8	88.5	37.98	82.4	79.2	75.32	.98	1
76	10.4	72	13.97	.15	8	88.5	38.47	82.5	79.4	76.31	.98	1
77	10.3	7.1	13.98	.15	8	88.5	38.96	82.6	79.5	77.31	.99	1
78	10.1	7.0	13.98	.15	8	88.5	39.46	82.7	79.6	78.31	.99	1
79	10.0	7.0	13.98	.15	8	88.6	39.95	82.8	798	79.30	.99	1
80	9.9	6.9	13.98	.15	8	88.6	40.45	82.9	79.9	80.30	.99	1
81	98	68	13.98	.14	8	88.6	40.94	83.0	80.0	81.29	.99	1
82	9.7	6.7	13.98	.14	8	88.6	41.49	83.1	80.1	82.29	.99	1
83	9.5	6.6	13.98	.14	8	88.6	41.93	83.2	80.3	83.29	.99	1
84	94	6.5	13.98	.14	8	88.6	42.43	83.2	80.4	84.28	.99	1
85	93	6.5	13.98	.14	8	88.7	42.92	83.3	80.5	85.28	.99	1
86	92	6.4	13.98	.14	8	88.7	43.42	83.4	80.6	86.28	.99	1
87	9.1	6.3	13.98	.13	8	88.7	43.91	83.5	80.7	87.27	.99	1
88	9.0	6.3	13.98	.13	8	88.7	44.41	83.6	80.8	88.27	.99	1
89	8.9	6.2	13.98	.13	8	88.7	44.90	83.6	80.9	89.27	.99	1
90	8.8	6.1	13.98	.13	8	88.7	45.40	83.7	81.0	90.27	.99	1
91	8.7	6.0	13.98	.13	8	88.7	45.89	83.8	81.1	91.26	.99	1
92	8.6	6.0	13.98	.13	8	88.8	46.39	83.8	81.2	92.26	.99	1
93	8.5	5.9	13.98	.13	8	88.8	46.89	83.9	81.3	93.26	.99	1
94	8.4	5.9	13.98	.12	8	88.8	47.38	83.9	81.4	94.25	.99	1
95	8.3	5.8	13.98	.12	8	88.8	47.88	84.0	81.5	95.25	.99	1
96	8.2	5.7	13.98	.12	8	88.8	48.37	84.1	81.6	96.25	.99	1
97	8.2	5.7	13.98	.12	8	88.8	48.87	84.2	81.6	97.25	.99	1
98	8.1	5.6	13.98	.12	8	88.8	49.37	84.2	81.7	98.24	.99	1
99	8.0	5.6	13.99	.12	8	88.8	49.86	84.3	81.8	99.24	.99	1
100	7.9	5.5	13.99	.12	8	88.9	50.36	84.3	81.9	100.24	.99	1
101	7.8	5.5	13.99	.12	8	88.9	50.85	84.4	82.0	101.24	.99	1

	PINION					PINION AND GEAR		GEAR				
12 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
102	7.8	5.4	13.99	.12	8	88.9	51.35	84.4	82.0	102.24	.99	1
103	7.7	5.3	13.99	.11	8	88.9	51.85	84.5	82.1	103.23	99	1
104	7.6	5.3	13.99	.11	8	88.9	52.34	84.5	82.2	104.23	.99	1
105	7.5	5.3	13.99	.11	8	88.9	52.84	84.6	82.3	105.23	.99	1
106	7.5	5.2	13.99	.11	8	88.9	53.34	84.6	82.3	106.23	.99	1
107	7.4	5.1	13.99	.11	8	88.9	53.83	84.7	82.4	107.22	.99	1
108	7.3	5.1	13.99	.11	8	88.9	54.33	84.7	82.5	108.22	.99	1
109	7.3	5.0	13.99	.11	8	88.9	54.83	84.8	82.6	109.22	.99	1
110	7.2	5.0	13.99	.11	8	89.0	55.33	84.9	82.6	110.22	.99	1
111	7.2	5.0	13.99	.11	8	89.0	55.82	84.9	82.7	111.22	.99	1
112	7.1	5.0	13.99	.10	8	89.0	56.32	84.9	82.7	112.21	.99	1
113	7.0	4.9	13.99	.10	8	89.0	56.82	85.0	82.8	113.21	.99	1
114	7.0	4.9	13.99	.10	8	89.0	57.31	85.0	82.9	114.21	.99	1
115	6.9	4.8	13.99	.10	8	89.0	57.81	85.0	82.9	115.21	.99	1
116	6.8	4.8	13.99	.10	8	89.0	58.31	85.1	83.0	116.21	99	1
117	6.8	4.7	13.99	.10	8	89.0	58.81	85.1	83.0	117.21	.99	1
118	6.7	4.7	13.99	.10	8	89.0	59.30	85.2	83.1	118.20	.99	1
119	6.7	4.6	13.99	.10	8	89.0	59.80	85.2	83.2	119.20	.99	1
120	6.6	4.6	13.99	.10	8	89.1	60.30	85.3	83.3	120.20	.99	1
121	6.6	4.6	13.99	.10	8	89.1	60.80	85.3	83.3	121.20	.99	1
122	6.5	4.5	13.99	.09	8	89.1	61.29	85.3	83.4	122.19	.99	1
123	6.5	4.5	13.99	.09	8	89.1	61.79	85.4	83.4	123.19	.99	1
124	6.4	4.5	13.99	.09	8	89.1	62.29	85.4	83.5	124.19	.99	1
125	6.4	4.4	13.99	.09	8	89.1	62.79	85.5	83.5	125.19	.99	1
126	6.3	4.4	13.99	.09	8	89.1	63.78	85.5	83.6	126.19	.99	1
127	6.3	4.4	13.99	.09	8	89.1	63.78	85.5	83.6	127.19	.99	1
128	6.2	4.3	13.99	.09	8	89.1	64.28	85.5	83.6	128.19	.99	1
129	6.2	4.3	13.99	.09	8	89.1	64.78	85.6	83.7	129.18	.99	1
130	6.1	4.3	13.99	.09	8	89.1	65.28	85.6	83.7	130.18	.99	1
131	6.1	4.2	13.99	.09	8	89.1	65.78	85.7	83.8	131.18	.99	1

	PINION					PINION AND GEAR		GEAR				
12 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH DIVIDE BY PITCH	NO OF CUTTER TO USE
132	6.0	4.2	13.99	09	8	89 1	66.27	85.7	83.8	132 18	.99	1

13 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
13	51.3	37.8	14.41		6	83.8	9.19					
14	48.9	35.9	14.47	.68	6	84.0	9.55	53.1	40.2	15.36	.23	5
15	46.7	34.2	14.51	.65	7	84.2	9.92	54.9	42.4	16.31	.25	5
16	44.6	32.6	14.55	.63	7	84.4	10.31	56.5	44.4	17.26	.27	4
17	42.7	31.2	14.59	.60	7	84.6	10.70	57.9	46.4	18.21	29	4
18	41.0	29.9	14.62	.58	7	84.8	11.10	59.3	48.2	19.17	.31	4
19	39.4	28.6	14.65	.56	7	85.0	11.51	60.6	49.9	20.13	.32	4
20	37.9	27.5	14.68	.54	7	85.2	11.93	61.8	51.4	21.09	.34	3
21	36.4	26.4	14.70	.52	7	85.4	12.35	62.9	52.9	22.05	.35	3
22	35.1	25.4	14.72	.51	7	85.5	12.78	63.9	54.2	23.02	.36	3
23	33.3	24.5	14.74	.49	7	85.7	13.21	64.9	55.5	23.99	.37	3
24	32.7	23.6	14.76	.47	7	85.8	13.65	65.8	56.7	24.95	.38	3
25	31.6	22.8	14.77	.46	7	85.9	14.09	66.6	57.8	25.92	.38	2
26	30.5	22.0	14.79	.44	7	86.1	14.50	67.4	58.9	26.89	.39	2
27	29.5	21.3	14.80	.43	7	86.2	14.98	68.1	59.9	27.87	.40	2
28	28.6	20.6	14.81	.42	7	86.3	15.43	68.8	60.8	28.84	.40	2
29	27.8	20.0	14.83	.41	7	86.4	15.89	69.5	61.7	29.82	.41	2
30	27.0	19.4	14.84	.40	7	86.5	16.35	70.1	62.5	30.80	.42	2
31	26.2	18.8	14.85	.38	7	86.6	16.81	70.7	63.3	31.77	.42	2
32	25.4	18.3	14.85	.37	8	86.7	17.27	71.2	64.1	32.75	.42	2
33	24.8	17.7	14.86	.36	8	86.8	17.73	71.7	64.8	33.73	.43	2
34	24.1	17.3	14.87	.35	8	86.8	18.20	72.2	65.4	34.71	.43	2
35	23.4	16.8	14.88	.34	8	86.9	18.67	72.7	66.1	35.69	.44	2
36	22.8	16.4	14.88	.34	8	87.0	19.14	73.1	66.7	36.68	.44	2
37	22.3	16.0	14.89	.33	8	87.1	19.61	73.6	67.3	37.66	.44	2
38	21.7	15.6	14.89	.32	8	87.1	20.08	74.0	67.8	38.65	.44	2
39	21.2	15.2	14.90	.31	8	87.2	20.55	74.4	68.3	39.63	.45	2
40	20.7	14.9	14.90	.31	8	87.3	21.03	74.7	68.8	40.62	.45	2
41	20.2	14.5	14.91	.30	8	87.3	21.51	75.1	69.3	41.60	.45	1
42	19.8	14.2	14.91	.29	8	87.4	21.98	75.4	69.8	42.59	.45	1

13 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
43	19.4	13.9	14.91	.29	8	87.4	22.46	75.7	70.3	43.58	.95	1
44	19.0	13.6	14.92	.28	8	87.5	22.94	76.1	70.7	44.57	.96	1
45	18.5	13.3	14.92	.28	8	87.6	23.42	76.4	71.1	45.56	.96	1
46	18.2	13.0	14.92	.27	8	87.6	23.90	76.6	71.5	46.54	.96	1
47	17.8	12.7	14.93	.26	8	87.6	24.38	76.9	71.9	47.53	.96	1
48	17.4	12.5	14.93	.26	8	87.7	24.46	77.2	72.2	48.52	.96	1
49	17.1	12.2	14.93	.25	8	87.7	25.35	77.4	72.5	49.51	.96	1
50	16.8	12.0	14.93	.25	8	87.8	25.83	77.7	72.9	50.50	.96	1
51	16.5	11.8	14.94	.24	8	87.8	26.32	77.9	73.2	51.49	.96	1
52	16.2	11.5	14.94	.24	8	87.9	26.80	78.1	73.5	52.48	.97	1
53	15.9	11.3	14.94	.24	8	87.9	27.29	78.3	73.8	53.48	.97	1
54	15.6	11.1	14.94	.23	8	87.9	27.77	78.5	74.1	54.47	.97	1
55	15.3	10.9	14.95	.23	8	88.0	28.26	78.7	74.4	55.46	.97	1
56	15.0	10.7	14.95	.22	8	88.0	28.74	78.9	74.6	56.45	.97	1
57	14.8	10.5	14.95	.22	8	88.0	29.23	79.1	74.9	57.45	.97	1
58	14.5	10.4	14.95	.22	8	88.1	29.72	79.3	75.2	58.49	.97	1
59	14.3	10.2	14.95	.21	8	88.1	30.21	79.5	75.4	59.43	.97	1
60	14.1	10.0	14.95	.21	8	88.1	30.70	79.7	75.6	60.42	.97	1
61	13.9	9.9	14.96	.21	8	88.2	31.18	79.8	75.9	61.42	.97	1
62	13.7	9.7	14.96	.20	8	88.2	31.67	80.0	76.1	62.41	.98	1
63	13.4	9.6	14.96	.20	8	88.2	32.16	80.1	76.3	63.40	.98	1
64	13.2	9.4	14.96	.20	8	88.2	32.65	80.3	76.5	64.40	.98	1
65	13.0	9.3	14.96	.19	8	88.3	33.14	80.4	76.7	65.39	.98	1
66	12.8	9.1	14.96	.19	8	88.3	33.63	80.6	76.9	66.39	.98	1
67	12.6	9.0	14.96	.19	8	88.3	34.12	80.7	77.1	67.38	.98	1
68	12.5	8.9	14.96	.18	8	88.3	34.62	80.9	77.3	68.37	.98	1
69	12.3	8.8	14.96	.18	8	88.4	35.11	81.0	77.5	69.37	.98	1
70	12.0	8.7	14.97	.18	8	88.4	35.60	81.1	77.7	70.36	.98	1
71	11.9	8.5	14.97	.18	8	88.4	36.09	81.3	77.9	71.36	.98	1
72	11.7	8.4	14.97	.17	8	88.4	36.58	81.4	78.0	72.35	.98	1

13 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
73	11.5	8.3	14.97	.17	8	88.4	37.07	81.5	78.2	73.35	.98	1
74	11.4	8.2	1497	.17	8	88.5	37.57	81.6	78.4	74.35	.98	1
75	11.2	8.1	14.97	.17	8	88.5	38.06	81.7	78.5	75.34	.98	1
76	11.1	8.0	1497	.17	8	88.5	38.55	81.8	78.7	76.34	.98	1
77	11.0	7.9	14.97	.16	8	88.5	39.04	81.9	78.8	77.33	.98	1
78	10.8	7.8	14.97	.16	8	88.5	39.54	82.0	78.9	78.33	.98	1
79	10.7	7.7	14.97	.16	8	88.6	40.03	82.1	79.0	79.33	.98	1
80	10.5	7.5	1497	.16	8	88.6	40.52	82.2	79.2	80.32	.98	1
81	10.4	7.5	14.97	.16	8	88.6	41.02	82.3	79.4	81.32	.98	1
82	10.3	7.4	14.97	.16	8	88.6	41.51	82.4	79.5	82.31	.98	1
83	10.2	7.3	14.98	.15	8	88.6	42.01	82.5	79.6	83.31	.98	1
84	10.1	7.2	14.98	.15	8	88.7	42.50	82.6	79.7	84.31	98	1
85	10.0	7.1	14.98	.15	8	88.7	42.99	82.7	79.8	85.30	.99	1
86	9.8	7.0	14.98	.15	8	88.7	43.49	82.8	80.0	86.30	.99	1
87	9.7	7.0	14.98	.15	8	88.7	43.98	82.9	80.1	87.30	.99	1
88	9.6	6.9	14.98	.14	8	88.7	4448	83.0	80.2	88.29	.99	1
89	9.5	6.8	14.98	.14	8	88.7	44.97	83.0	80.3	88.29	.99	1
90	9.4	6.7	14.98	.14	8	88.7	45.47	83.1	80.4	90.29	.99	1
91	9.3	6.7	14.98	.14	8	88.7	45.96	83.2	80.5	91.28	.99	1
92	9.2	6.6	14.98	.14	8	88.8	46.46	83.2	80.6	92.28	.99	1
93	9.1	6.5	14.98	.14	8	88.8	46.95	83.3	80.7	93.28	.99	1
94	9.0	6.4	14.98	.13	8	88.8	47.45	83.4	80.8	94.27	.99	1
95	8.9	6.4	14.98	.13	8	88.8	47.94	83.4	80.9	95.27	.99	1
96	8.8	6.3	14.98	.13	8	88.8	4844	83.5	81.0	96.27	.99	1
97	8.7	6.2	14.98	.13	8	88.8	48.93	83.6	81.1	97.27	.99	1
98	8.6	6.2	14.98	.13	8	88.8	49.43	83.6	81.2	98.26	.99	1
99	8.5	6.1	14.98	.13	8	88.8	49.92	83.7	81.3	99.26	.99	1
100	8.5	6.0	14.98	.13	8	88.9	50.42	83.8	81.4	100.26	.99	1
101	8.4	6.0	14.98	.13	8	88.9	50.91	83.8	81.4	101.26	.99	1
102	8.3	5.9	14.98	.12	8	88.9	51.41	83.9	81.5	102.25	.99	1

13 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
103	8.2	5.9	14.98	.12	8	88.9	51.91	84.0	81.6	103.25	.99	1
104	8.1	5.8	14.98	.12	8	88.9	52.40	84.0	81.7	104.25	.99	1
105	8.1	5.8	14.98	.12	8	88.9	5290	84.1	81.7	105.25	.99	1
106	8 0	5.7	14.98	.12	8	88.9	53.40	84.1	81.8	106.24	.99	1
107	7.9	5.7	14.98	.12	8	88.9	53.89	84.2	81.9	107 24	.99	1
108	7.9	5.6	14.99	.12	8	88.9	5439	84.2	82.0	108.24	.99	1
109	7.8	5.6	14 99	.12	8	89.0	54.88	84.3	82.0	109.24	.99	1
110	7.7	5.5	14.99	.12	8	89.0	55.38	84.3	82.1	110.24	.99	1
111	7.6	5.5	14 99	.11	8	89.0	55.88	84.4	82 2	111.23	.99	1
112	7.6	5.4	14.99	.11	8	89.0	56 37	84.4	82.3	112.23	.99	1
113	7.5	5.4	14.99	.11	8	89 0	56.87	84.5	82.3	113.23	.99	1
114	7.4	5.3	14.99	.11	8	89.0	5737	84.5	82.4	114 23	.99	1
115	7.4	5.3	14.99	.11	8	89.0	5787	84.6	82 5	115.22	.99	1
116	7.3	5.2	14.99	.11	8	89.0	58.36	84 6	82.5	116.22	.99	1
117	7.2	5.2	14.99	.11	8	89 0	58.86	84 7	82 6	117.22	.99	1
118	7.2	5.1	14.99	.11	8	89.0	5936	84.7	82.7	118.22	.99	1
119	7.1	5.1	14.99	.11	8	89.0	5985	84.8	82.7	119.22	.99	1
120	7.1	5.1	14.99	.11	8	89.0	6035	84 8	82 8	120.22	.99	1
121	7.0	5.0	14.99	.10	8	89.1	60.85	84.8	82.8	121.21	.99	1
122	7.0	5.0	14.99	.10	8	89.1	61.35	84.9	82.9	122.21	.99	1
123	6.9	5.0	14.99	.10	8	89.1	61.84	84 9	82.9	123.21	.99	1
124	6.9	4.9	14.99	.10	8	89.1	62 34	85.0	83.0	124 21	.99	1
125	6.8	4.9	14.99	.10	8	89.1	62 84	85.0	83.0	125.21	.99	1
126	6.8	4.8	14.99	.10	8	89.1	63.33	85.0	83.1	126.21	.99	1
127	6.7	4.8	14.99	.10	8	89.1	63.83	85.1	83.1	127.20	.99	1
128	6.6	4.8	14.99	.10	8	89.1	6433	85.1	83.2	128 20	.99	1
129	6.6	4.7	14.99	.10	8	89.1	6483	85.2	83.3	129.20	.99	1
130	6.5	4.7	14.99	.10	8	89.1	65.31	85.2	83.3	130.20	99	1
131	6.5	4.6	14.99	.10	8	89.1	65.81	85.2	83.4	131.20	.99	1
132	6.4	4.6	14.99	.10	8	89.1	66.31	85.3	83.4	132.20	.99	1

	PINION					PINION AND GEAR		GEAR				
14 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
14	50.8	38.3	15.41	.70	6	84.2	9.90					
15	48.6	36.5	15.46	.68	6	84.4	10.26	52.6	40.5	16.36	.73	5
16	46.6	34.9	15.51	.65	6	84.6	10.63	54.2	42.6	17.31	.75	5
17	44.7	33.5	15.55	.63	6	84.8	11.01	55.7	44.5	18.27	.77	4
18	42.9	32.0	15.58	.61	6	85.0	11.40	57.1	46.3	19.23	.79	4
19	41.3	30.8	15.61	.59	6	85.1	11.80	58.5	48.0	20.18	.80	4
20	39.7	29.6	15.64	.57	6	85.3	12.21	59.7	49.5	21.15	.82	3
21	38.2	28.4	15.67	.55	7	85.5	12.62	60.9	51.0	22.11	.83	3
22	36.9	27.4	15.69	.53	7	85.6	13.04	61.9	52.4	23.07	.84	3
23	35.6	26.4	15.71	.52	7	85.7	13.46	62.9	53.7	24.04	.85	3
24	34.4	25.5	15.73	.50	7	85.9	13.89	63.9	55.0	25.01	.86	3
25	33.3	24.6	15.75	.49	7	86.0	14.33	64.8	56.1	25.98	.87	3
26	32.2	23.8	15.76	.47	7	86.1	14.76	65.6	57.2	26.95	.88	2
27	31.2	23.0	15.78	.46	7	86.2	15.21	66.4	58.2	27.92	.89	2
28	30.3	22.3	15.79	.45	7	86.3	15.65	67.1	59.2	28.90	.89	2
29	29.3	21.7	15.80	.43	7	86.4	16.10	67.8	60.1	29.87	.90	2
30	28.5	21.0	15.81	.42	7	86.5	16.55	68.4	61.0	30.85	.90	2
31	27.7	20.4	15.82	.41	7	86.6	17.01	69.0	61.8	31.82	.91	2
32	26.9	19.8	15.83	.40	7	86.7	17.46	69.6	62.6	32.80	.91	2
33	26.2	19.3	15.84	.39	7	86.8	17.92	70.2	63.3	33.78	.92	2
34	25.5	18.8	15.85	.38	7	86.9	18.38	70.7	64.0	34.76	.92	2
35	24.8	18.3	15.86	.37	7	87.0	18.85	71.2	64.7	35.74	.93	2
36	24.2	17.8	15.86	.36	7	87.0	19.31	71.7	65.3	36.72	.93	2
37	23.6	17.4	15.87	.35	7	87.1	19.78	72.2	66.0	37.71	.93	2
38	23.0	17.0	15.88	.34	7	87.2	20.25	72.6	66.5	38.69	.94	2
39	22.5	16.6	15.88	.34	7	87.2	20.72	73.0	67.0	39.68	.94	2
40	22.0	16.2	15.89	.33	7	87.3	21.19	73.4	67.6	40.66	.94	2
41	21.5	15.8	15.89	.32	7	87.4	21.66	73.8	68.1	41.65	.94	2
42	21.0	15.4	15.90	.31	7	87.4	22.14	74.2	68.6	42.63	.95	1
43	20.6	15.1	15.90	.31	7	87.5	22.61	74.5	69.0	43.62	.95	1

14 TEETH INTO	PINION FACE ANGLE	PINION CUTTING ANGLE	PINION OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	PINION BACKING FOR 1 PITCH. DIVIDE BY PITCH	PINION NO. OF CUTTER TO USE	PINION AND GEAR BACK ANGLE	PINION AND GEAR PITCH CONE RADIUS. DIVIDE BY PITCH	GEAR FACE ANGLE	GEAR CUTTING ANGLE	GEAR OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	GEAR BACKING FOR 1 PITCH. DIVIDE BY PITCH	GEAR NO. OF CUTTER TO USE
44	20.1	14.8	15.91	.30	7	87.5	23.09	74.8	69.5	44.61	.95	1
45	19.7	14.5	15.91	.29	7	87.6	23.56	75.2	69.9	45.59	.95	1
46	19.3	14.2	15.91	.29	7	87.6	24.04	75.5	70.3	46.58	.95	1
47	18.9	13.9	15.92	.28	7	87.7	24.52	75.8	70.7	47.57	.96	1
48	18.6	13.6	15.92	.28	7	87.7	25.00	76.0	71.1	48.56	.96	1
49	18.2	13.3	15.92	.27	7	87.7	25.48	76.3	71.5	49.55	.96	1
50	17.8	13.1	15.93	.27	7	87.8	25.96	76.6	71.8	50.54	.96	1
51	17.5	12.8	15.93	.26	7	87.8	26.44	76.8	72.2	51.53	.96	1
52	17.2	12.6	15.93	.26	7	87.9	26.93	77.1	72.5	52.52	.96	1
53	16.9	12.4	15.93	.25	7	87.9	27.41	77.3	72.8	53.51	.96	1
54	16.6	12.1	15.94	.25	7	87.9	27.89	77.5	73.1	54.50	.97	1
55	16.3	11.9	15.94	.24	7	88.0	28.38	77.8	73.4	55.49	.97	1
56	16.0	11.7	15.94	.24	7	88.0	28.86	78.0	73.7	56.48	97	1
57	15.7	11.5	15.94	.24	7	88.0	29.35	78.2	74.0	57.48	.97	1
58	15.5	11.3	15.94	.23	7	88.1	29.83	78.4	74.2	58 47	.97	1
59	15.3	11.2	15.95	.23	7	88.1	30.32	78.5	74.5	59.46	.97	1
60	15.0	11.0	15.95	.22	7	88.1	30.81	78.7	74.7	60 45	.97	1
61	14.8	10.8	15.95	.22	7	88.2	31.29	78.9	75.0	61.45	.97	1
62	14.5	10.6	15.95	.22	7	88.2	31.78	79.1	75.2	62 44	.97	1
63	14.3	10.5	15.95	.21	7	88.2	32.27	79.3	75.4	63 43	.97	1
64	14.1	10.3	15.95	.21	7	88.2	32.76	79.4	75.6	64.43	.97	1
65	13.9	10.1	15.95	.21	7	88.3	33.25	79.6	75.9	65 42	.97	1
66	13.7	10.0	15.96	.21	7	88.3	33.73	79.7	76.1	66.42	.98	1
67	13.5	9.9	15.96	.20	7	88.3	34.22	79.9	76.3	67.41	.98	1
68	13.3	9.7	15.96	.20	7.	88.3	34.71	80.0	76.5	68 41	.98	1
69	13.1	9.6	15.96	.20	7	88.4	35.20	80.2	76.7	69.40	.98	1
70	12.9	9.5	15.96	.19	7	88 4	35.69	80.3	76.9	70.39	.98	1
71	12.7	9.3	15.96	.19	7	88.4	36.18	80.4	77.1	71.39	.98	1
72	12.5	9.2	15.96	.19	7	88.4	36.67	80.6	77.3	72.38	.98	1
73	12.3	9.1	15.96	.19	7	88.5	37.17	80.7	77.4	73.38	.98	1

14	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
74	12.2	9.0	15.96	.18	7	88.5	37.66	80.8	77.6	74.37	.98	1
75	12.0	8.8	15.97	.18	7	88.5	38.15	81.0	77.8	75.37	.98	1
76	11.9	8.7	15.97	.18	7	88.5	38.64	81.1	77.9	76.36	.98	1
77	11.7	8.6	15.97	.18	7	88.5	39.13	81.2	78.1	77.36	.98	1
78	11.6	8.5	15.97	.17	7	88.5	39.62	81.3	78.2	78.35	.98	1
79	11.4	8.4	15.97	.17	7	88.6	40.11	81.4	78.4	79.35	.98	1
80	11.3	8.3	15.97	.17	7	88.6	40.61	81.5	78.5	80.35	.98	1
81	11.1	8.2	15.97	.17	7	88.6	41.10	81.6	78.7	81.34	.98	1
82	11.0	8.1	15.97	.17	7	88.6	41.59	81.7	78.8	82.34	.98	1
83	10.9	8.0	15.97	.16	7	88.6	42.09	81.8	78.9	83.33	.98	1
84	10.7	7.9	15.97	.16	7	88.7	42.58	81.9	79.0	84.33	.98	1
85	10.6	7.8	15.97	.16	7	88.7	43.07	82.0	79.2	85.33	.98	1
86	10.5	7.7	15.97	.16	7	88.7	43.57	82.1	79.3	86.32	.98	1
87	10.4	7.6	15.97	.16	7	88.7	44.06	82.2	79.4	87.32	.98	1
88	10.3	7.5	15.97	.16	7	88.7	44.55	82.3	79.5	88.32	.98	1
89	10.1	7.4	15.98	.15	7	88.7	45.05	82.4	79.7	89.31	.99	1
90	10.0	7.4	15.98	.15	7	88.7	45.54	82.5	79.8	90.31	.99	1
91	9.9	7.3	15.98	.15	7	88.7	46.04	82.5	79.9	91.31	.99	1
92	9.8	7.2	15.98	.15	7	88.8	46.53	82.6	80.0	92.30	.99	1
93	9.7	7.1	15.98	.15	7	88.8	47.02	82.7	80.1	93.30	.99	1
94	9.6	7.0	15.98	.15	7	88.8	47.52	82.8	80.2	94.30	.99	1
95	9.5	7.0	15.98	.14	7	88.8	48.01	82.9	80.3	95.29	.99	1
96	9.4	6.9	15.98	.14	7	88.8	48.51	82.9	80.4	96.29	.99	1
97	9.3	6.9	15.98	.14	7	88.8	49.00	83.0	80.5	97.29	.99	1
98	9.2	6.8	15.98	.14	7	88.8	49.50	83.0	80.6	98.28	.99	1
99	9.1	6.7	15.98	.14	7	88.8	49.99	83.1	80.7	99.28	.99	1
100	9.0	6.6	15.98	.14	7	88.9	50.49	83.2	80.8	100.28	.99	1
101	8.9	6.6	15.98	.14	7	88.9	50.98	83.3	80.9	101.28	.99	1
102	8.9	6.5	15.98	.13	7	88.9	51.48	83.3	81.0	102.27	.99	1
103	8.6	6.4	15.98	.13	7	88.9	51.97	83.4	81.0	103.27	.99	1

14 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
104	8.7	6.4	15.98	.13	7	88.9	52.47	83.5	81.1	104.27	.99	1
105	8.6	6.3	15.98	.13	7	88.9	52.97	83.5	81.2	105.27	.99	1
106	8.5	6.3	15.98	.13	7	88.9	53.46	83.6	81.3	106.26	.99	1
107	8.5	6.2	15.98	.13	7	88.9	53.96	83.6	81.4	107.26	.99	1
108	84	6.2	15.98	.13	7	88.9	54.45	83.7	81.5	108.26	.99	1
109	8.3	6.1	15.98	.13	7	89.0	54.95	83.7	81.5	109.26	.99	1
110	8.2	6.0	15.98	.12	7	89.0	55.44	83.8	81.6	110.25	.99	1
111	8.1	6.0	15.98	.12	7	89.0	55.94	83.9	81.7	111.25	.99	1
112	8.1	5.9	15.98	12	7	89.9	56.43	83.9	81.8	112.25	.99	1
113	8.0	5.9	15.98	.12	7	89.0	56.93	84.0	81.8	113.25	.99	1
114	7.9	5.8	15.98	.12	7	89.0	57.43	84.0	81.9	114.24	.99	1
115	7.9	5.8	15.98	.12	7	89.0	57.92	84.1	82.0	115.24	.99	1
116	7.8	5.7	15.99	.12	7	89.0	58.42	84.1	82.0	116.24	.99	1
117	7.7	5.7	15.99	.12	7	89.0	58.92	84.2	82.1	117.24	.99	1
118	7.7	5.6	15.99	.12	7	89.0	59.41	84.2	82.2	118.24	.99	1
119	7.6	5.6	15.99	..11	7	89.0	59.91	84.3	82.2	119 23	.99	1
120	7.5	5.5	15.99	.11	7	89.0	60.41	84.3	82 3	120.23	.99	1
121	7.5	5.5	15.99	.11	7	89.1	60.90	84.4	82.3	121 23	.99	1
122	7.4	5.5	15.99	11	7	89.1	61.40	84.4	82.4	122.23	.99	1
123	7.4	5.4	15.99	.11	7	89.1	61.90	84.5	82 5	123.23	.99	1
124	7.3	5.4	15.99	.11	7	89.1	62.39	84.5	82.5	124.23	.99	1
125	7.2	5.3	15.99	.11	7	89.1	62.89	84.5	82.6	125.22	.99	1
126	7.2	5.3	15.99	.11	7	89.1	63.39	84.6	82 6	126.22	.99	1
127	7.1	5.2	15.99	.11	7	89.1	63.88	84 6	82.7	12722	99	1
128	7.1	5.2	15.99	.11	7	89.1	64.38	84.7	82.8	128 22	.99	1
129	7.0	5.1	15.99	.11	7	89.1	64.88	84.7	82.8	129.22	.99	1
130	7.0	5.1	15.99	.10	7	89.1	65.38	84.8	82.9	130.21	.99	1
131	6.9	5.1	15.99	.10	7	89.1	65.88	84.8	82.9	131.21	.99	1
132	6.9	5.0	15.99	.10	7	89.1	66.37	84.8	83 0	132 21	.99	1

15 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
15	50.4	38.7	16.41	.70	5	84.6	10.61					
16	48.4	37.1	16.46	.68	6	84.8	10.97	52.1	40.8	17.37	.73	5
17	46.5	35.5	16.50	.66	6	84.9	11.34	53.8	42.7	18.32	.75	4
18	44.7	34.1	16.54	.64	6	85.1	11.71	55.1	44.5	19.28	.77	4
19	43.0	32.8	16.57	.62	6	85.3	12.10	56.5	46.2	20.24	.78	4
20	41.5	31.5	16.60	.60	6	85.4	12.50	57.7	47.8	21.20	.80	4
21	40.0	30.4	16.63	.58	6	85.5	12.90	58.9	49.3	22.16	.81	3
22	38.6	29.3	16.65	.56	6	85.7	13.31	60.0	50.8	23.13	.82	3
23	37.3	28.3	16.68	.54	6	85.8	13.73	61.1	52.0	24.09	.84	3
24	36.1	27.3	16.70	.53	6	85.9	14.15	62.1	53.3	25.06	.85	3
25	34.9	26.4	16.72	.51	6	86.1	14.58	63.0	54.5	26.03	.86	3
26	33.8	25.5	16.73	.50	6	86.2	15.01	63.9	55.6	27.00	.86	3
27	32.8	24.8	16.75	.48	6	86.3	15.44	64.7	56.7	27.97	.87	2
28	31.8	24.0	16.76	.47	7	86.4	15.88	65.5	57.7	28.94	.88	2
29	30.9	23.3	16.78	.46	7	86.5	16.32	66.2	58.6	29.92	.89	2
30	30.0	22.6	16.79	.45	7	86.6	16.77	66.9	59.5	30.90	.89	2
31	29.1	22.0	16.80	.43	7	86.7	17.22	67.5	60.4	31.87	.90	2
32	28.3	21.3	16.81	.42	7	86.8	17.67	68.2	61.2	32.85	.90	2
33	27.6	20.8	16.82	.41	7	86.8	18.12	68.7	61.9	33.83	.91	2
34	26.9	20.2	16.83	.40	7	86.9	18.58	69.3	62.7	34.81	.91	2
35	26.2	19.7	16.84	.39	7	87.0	19.04	69.8	63.3	35.79	.92	2
36	25.6	19.2	16.85	.38	7	87.1	19.50	70.3	64.0	36.77	.92	2
37	25.0	18.7	16.85	.37	7	87.1	19.96	70.8	64.6	37.75	.92	2
38	24.3	18.3	16.86	.36	7	87.2	20.43	71.3	65.2	38.73	.93	2
39	23.8	17.9	16.87	.36	7	87.3	20.89	71.7	65.8	39.72	.93	2
40	23.2	17.4	16.87	.35	7	87.3	21.36	72.1	66.3	40.70	.93	2
41	22.7	17.0	16.88	.34	7	87.4	21.83	72.5	66.9	41.69	.94	2
42	22.2	16.7	16.88	.33	7	87.4	22.30	72.9	67.4	42.67	.94	2
43	21.8	16.3	16.89	.33	7	87.5	22.77	73.3	67.9	43.66	.94	2
44	21.3	16.0	16.89	.32	7	87.5	23.24	73.7	68.3	44.64	.94	1

	PINION					PINION AND GEAR		GEAR				
15 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
45	20.9	15.6	16.90	.31	7	87.6	23.72	74.0	68.8	45.63	.95	1
46	20.4	15.3	16.90	.31	7	87.6	24.19	74.3	69.2	46.62	.95	1
47	20.0	15.0	16.91	.30	7	87.7	24.67	74.6	69.6	47.61	.95	1
48	19.6	14.7	16.91	.29	7	87.7	25.14	75.0	70.0	48.59	.95	1
49	19.2	14.4	16.91	.29	7	87.8	25.62	75.2	70.4	49.58	.95	1
50	18.9	14.1	16.92	.28	7	87.8	26.10	75.5	70.8	50.57	.96	1
51	18.5	13.9	16.92	.28	7	87.8	26.58	75.8	71.1	51.56	.96	1
52	18.2	13.6	16.92	.27	7	87.9	27.06	76.0	71.5	52.55	.96	1
53	17.9	13.4	16.92	.27	7	87.9	27.54	76.3	71.8	53.54	.96	1
54	17.5	13.1	16.93	.26	7	87.9	28.02	76.5	72.1	54.53	.96	1
55	17.2	12.9	16.93	.26	7	88.0	28.50	76.8	72.4	55.53	.96	1
56	17.0	12.7	16.93	.26	7	88.0	28.99	77.0	72.7	56.52	.96	1
57	16.7	12.5	16.93	.25	7	88.1	29.47	77.2	73.0	57.51	.96	1
58	16.4	12.2	16.94	.25	7	88.1	29.95	77.5	73.3	58.50	.97	1
59	16.1	12.1	16.94	.24	7	88.1	30.44	77.7	73.6	59.49	.97	1
60	15.9	11.9	16.94	.24	7	88.1	30.92	77.8	73.8	60.48	.97	1
61	15.6	11.7	16.94	.24	7	88.2	31.41	78.0	74.1	61.48	.97	1
62	15.4	11.5	16.94	.23	7	88.2	31.89	78.2	74.3	62.47	.97	1
63	15.1	11.3	16.95	.23	7	88.2	32.38	78.4	74.6	63.46	.97	1
64	14.9	11.1	16.95	.23	7	88.3	32.87	78.6	74.8	64.46	.97	1
65	14.7	11.0	16.95	.22	7	88.3	33.35	78.8	75.0	65.45	.97	1
66	14.5	10.8	16.95	.22	7	88.3	33.84	78.9	75.2	66.44	.97	1
67	14.3	10.7	16.95	.22	7	88.3	34.33	79.1	75.5	67.44	.97	1
68	14.1	10.5	16.95	.21	7	88.3	34.82	79.2	75.7	68.43	.97	1
69	13.9	10.4	16.95	.21	7	88.4	35.31	79.4	75.9	69.42	.97	1
70	13.6	10.2	16.96	.21	7	88.4	35.79	79.5	76.1	70.42	.98	1
71	13.4	10.1	16.96	.20	7	88.4	36.28	79.7	76.3	71.41	.98	1
72	13.2	9.9	16.96	.20	7	88.4	36.77	79.8	76.5	72.41	.98	1
73	13.0	9.8	16.96	.20	7	88.5	37.26	80.0	76.7	73.40	.98	1
74	12.9	9.7	16.96	.20	7	88.5	37.75	80.1	76.9	74.40	.98	1

	PINION					PINION AND GEAR		GEAR				
15 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
75	12.7	9.5	16.96	.19	7	88.5	38.24	80.2	77.0	75.39	.98	1
76	12.5	9.4	16.96	.19	7	88.5	38.73	80.4	77.2	76.39	.98	1
77	12.4	9.3	16.96	.19	7	88.5	39.22	80.5	77.4	77.38	.98	1
78	12.2	9.2	16.96	.19	7	88.6	39.71	80.6	77.5	78.38	.98	1
79	12.1	9.0	16.96	.18	7	88.6	40.20	80.7	77.7	79.37	.98	1
80	11.9	8.9	16.97	.18	7	88.6	40.70	80.9	77.8	80.37	.98	1
81	11.8	8.8	16.97	.18	7	88.6	41.19	81.0	78.0	81.36	.98	1
82	11.7	8.7	16.97	.18	7	88.6	41.68	81.1	78.1	82.36	.98	1
83	11.5	8.6	16.97	.18	7	88.6	42.17	81.2	78.3	83.36	.98	1
84	11.4	8.5	16.97	.17	7	88.7	42.66	81.3	78.4	84.35	.98	1
85	11.3	8.4	16.97	.17	7	88.7	43.16	81.4	78.5	85.35	.98	1
86	11.1	8.3	16.97	.17	7	88.7	43.65	81.5	78.7	86.34	.98	1
87	11.0	8.2	16.97	.17	7	88.7	44.14	81.6	78.8	87.34	.98	1
88	10.9	8.2	16.97	.17	7	88.7	44.64	81.7	78.9	88.34	.98	1
89	10.8	8.1	16.97	.16	7	88.7	45.13	81.7	79.0	89.33	.98	1
90	10.7	8.0	16.97	.16	7	88.7	45.62	81.8	79.1	90.33	.98	1
91	10.5	7.9	16.97	.16	7	88.8	46.11	81.9	79.3	91.32	.98	1
92	10.4	7.8	16.97	.16	7	88.8	46.61	82.0	79.4	92.32	.98	1
93	10.3	7.7	16.97	.16	7	88.8	47.10	82.1	79.5	93.32	.98	1
94	10.2	7.6	16.97	.15	7	88.8	47.59	82.2	79.6	94.31	.98	1
95	10.1	7.5	16.98	.15	7	88.8	48.09	82.3	79.7	95.31	.99	1
96	10.0	7.5	16.98	.15	7	88.8	48.58	82.4	79.8	96.31	.99	1
97	9.9	7.4	16.98	.15	7	88.8	49.08	82.4	79.9	97.30	.99	1
98	9.8	7.3	16.98	.15	7	88.8	49.57	82.5	80.0	98.30	.99	1
99	9.7	7.3	16.98	.15	7	88.9	50.06	82.6	80.1	99.30	.99	1
100	9.6	7.2	16.98	.15	7	88.9	50.56	82.6	80.2	100.30	.99	1
101	9.5	7.1	16.98	.14	7	88.9	51.05	82.7	80.3	101.29	.99	1
102	9.4	7.0	16.98	.14	7	88.9	51.55	82.8	80.4	102.29	.99	1
103	9.3	7.0	16.98	.14	7	88.9	52.09	82.9	80.5	103.29	.99	1
104	9.2	6.9	16.98	.14	7	88.9	52.54	82.9	80.6	104.28	.99	1

15 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH DIVIDE BY PITCH	NO. OF CUTTER TO USE
105	9.1	6 9	16 98	14	7	88.9	53 03	83.0	80.7	105.28	.99	1
106	9.1	6.8	16.98	.14	7	88.9	53 53	83.0	80.8	106 28	.99	1
107	9.0	6.7	16.98	.14	7	88.9	54.02	83.1	80.9	107.28	.99	1
108	8.9	6.7	16.98	.14	7	88.9	54.52	83.2	80.9	108.28	99	1
109	8.8	6.6	16.98	.13	7	89 0	55.01	83.2	81.0	109.27	.99	1
110	8.7	6.5	16.98	.13	7	89.0	55.51	83.3	81.1	110.27	.99	1
111	8.7	6.5	16.98	.13	7	89.0	56 00	83.4	81.2	111.27	.99	1
112	8.6	6.4	16.98	.13	7	89.0	56 50	83.4	81.3	112.26	.99	1
113	8.5	6.4	16 98	.13	7	89.0	56 99	83.5	81.3	113.26	.99	1
114	8.5	6.3	16.98	.13	7	89.0	57.49	83.5	81.4	114.26	.99	1
115	8.4	6.3	16.98	.13	7	89 0	5799	83.6	81.5	115.26	.99	1
116	8.3	6.2	16.98	.13	7	89.0	58.48	83.6	81.6	116.26	99	1
117	8.2	6.2	16.98	.12	7	89.0	58.98	83.7	81.6	117.25	.99	1
118	8.1	6.1	16.98	.12	7	89.0	59.48	83.8	81.7	118.25	.99	1
119	8.1	6.0	16.98	.12	7	89.0	59.97	83.8	81.8	119.25	.99	1
120	8.0	6.0	16.98	.12	7	89.0	60.47	83.9	81.9	120.25	.99	1
121	8.0	5.9	16.98	.12	7	89.1	6096	83.9	81.9	121.25	.99	1
122	7.9	5.9	16.98	.12	7	89.1	61.46	84.0	82.0	122.24	.99	1
123	7.8	5.9	16.99	.12	7	89.1	61.96	84.0	82.0	123.24	.99	1
124	7.8	5.8	16.99	.12	7	89.1	62.45	84.0	82.1	124.24	.99	1
125	7.7	5.8	16.99	.12	7	89.1	6295	84.1	82.2	125.24	.99	1
126	7.6	5.7	16.99	.11	7	89.1	63.44	84.1	82.2	126.24	.99	1
127	7.6	5.7	16.99	.11	7	89.1	63.94	84.2	82.3	127.23	.99	1
128	7.5	5.6	16.99	.11	7	89.1	64.44	84.2	82.3	128.23	.99	1
129	7.5	5.6	16.99	.11	7	89.1	64.93	84.3	82.4	129.23	.99	1
130	7.4	5.5	16.99	.11	7	89.1	65.42	84.3	82.5	130.23	.99	1
131	7.4	5.5	16.99	.11	7	89.1	65.91	84.4	82.5	131.23	.99	1
132	7.3	5.5	16.99	.11	7	89.1	66.41	84.4	82.6	132.23	.99	1

16 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
16	50.0	39.1	17.41	.70	5	84.9	11.31					
17	48.2	37.6	17.46	.68	5	85.1	11.67	51.6	41.0	18.37	.73	5
18	46.4	36.1	17.50	.66	5	85.2	12.04	53.1	42.8	19.33	.75	4
19	44.7	34.8	17.53	.64	6	85.4	12.42	55.2	44.5	20.29	.76	4
20	43.2	33.5	17.56	.62	6	85.5	12.81	55.8	46.1	21.25	.78	4
21	41.7	32.3	17.59	.60	6	85.7	13.20	57.0	47.6	22.21	.79	3
22	40.3	31.2	17.62	.59	6	85.8	13.60	58.2	49.1	23.18	.81	3
23	38.9	30.1	17.64	.57	6	85.9	14.01	59.3	50.4	24.14	.82	3
24	37.7	29.1	17.67	.55	6	86.0	14.42	60.3	51.7	25.11	.83	3
25	36.5	28.1	17.69	.54	6	86.1	14.84	61.2	52.9	26.08	.84	3
26	35.4	27.2	17.71	.52	6	86.2	15.26	62.2	54.0	27.05	.85	3
27	34.3	26.4	17.72	.51	6	86.3	15.69	63.0	55.1	28.02	.86	3
28	33.3	25.6	17.74	.49	6	86.4	16.12	63.8	56.1	28.99	.87	3
29	32.3	24.9	17.75	.48	6	86.5	16.56	64.6	57.1	29.97	.87	3
30	31.5	24.1	17.77	.47	6	86.6	17.00	65.3	58.0	30.94	.88	2
31	30.6	23.5	17.78	.46	6	86.7	17.44	66.0	58.9	31.92	.89	2
32	29.8	22.8	17.79	.45	6	86.8	17.89	66.7	59.7	32.90	.89	2
33	29.0	22.2	17.80	.43	6	86.9	18.34	67.3	60.5	33.87	.90	2
34	28.3	21.7	17.81	.42	6	86.9	18.79	67.9	61.3	34.85	.90	2
35	27.5	21.1	17.82	.41	6	87.0	19.24	68.4	62.0	35.83	.91	2
36	26.9	20.6	17.83	.40	6	87.1	19.70	68.9	62.7	36.81	.91	2
37	26.2	20.1	17.84	.40	6	87.2	20.15	69.5	63.3	37.80	.92	2
38	25.6	19.6	17.84	.34	6	87.2	20.61	69.9	64.0	38.78	.92	2
39	25.0	19.2	17.85	.33	6	87.3	21.08	70.4	64.6	39.76	.92	2
40	24.5	18.7	17.86	.37	6	87.3	21.54	70.9	65.1	40.74	.93	2
41	23.9	18.3	17.86	.36	6	87.4	22.01	71.3	65.7	41.73	.93	2
42	23.4	17.9	17.87	.35	6	87.4	22.47	71.7	66.2	42.71	.93	2
43	22.9	17.5	17.87	.35	6	87.5	22.94	72.1	66.7	43.70	.93	2
44	22.4	17.1	17.88	.34	6	87.6	23.41	72.5	67.2	44.68	.94	2
45	22.0	16.8	17.88	.33	6	87.6	23.88	72.8	67.7	45.67	.94	1

	PINION					PINION AND GEAR		GEAR				
16 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
46	21.5	16.4	17.89	.33	6	87.6	24.35	73.2	68.1	46.66	.94	1
47	21.1	16.1	17.89	.32	6	87.7	24.82	73.5	68.5	47.64	.94	1
48	20.7	15.8	17.90	.31	6	87.7	25.30	73.8	69.0	48.63	.95	1
49	20.3	15.5	17.90	.31	6	87.8	25.77	74.1	69.3	49.62	.95	1
50	19.9	15.2	17.90	.30	7	87.8	26.25	74.5	69.7	50.61	.95	1
51	19.6	15.0	17.91	.30	7	87.8	26.72	74.7	70.1	51.60	.95	1
52	19.2	14.7	17.91	.29	7	87.8	27.20	75.0	70.5	52.59	.95	1
53	18.9	14.4	17.91	.29	7	87.9	27.68	75.3	70.8	53.58	.95	1
54	18.5	14.1	17.92	.28	7	88.0	28.16	75.5	71.1	54.57	.96	1
55	18.2	13.9	17.92	.28	7	88.0	28.64	75.8	71.5	55.56	.96	1
56	17.9	13.6	17.92	.27	7	88.0	29.12	76.0	71.8	56.55	.96	1
57	17.6	13.4	17.93	.27	7	88.1	29.60	76.3	72.1	57.54	.96	1
58	17.3	13.2	17.93	.26	7	88.1	30.08	76.5	72.4	58.53	.96	1
59	17.0	13.0	17.93	.26	7	88.1	30.57	76.7	72.7	59.52	.96	1
60	16.8	12.8	17.93	.25	7	88.1	31.05	76.9	72.9	60.51	.96	1
61	16.5	12.6	17.93	.25	7	88.2	31.53	77.1	73.2	61.51	.96	1
62	16.3	12.4	17.94	.25	7	88.2	32.02	77.3	73.5	62.50	.97	1
63	16.0	12.2	17.94	.24	7	88.2	32.50	77.5	73.7	63.49	.97	1
64	15.8	12.0	17.94	.24	7	88.3	32.99	77.7	74.0	64.48	.97	1
65	15.5	11.8	17.94	.24	7	88.3	33.47	77.9	74.2	65.48	.97	1
66	15.3	11.6	17.94	.23	7	88.3	33.96	78.1	74.4	66.47	.97	1
67	15.1	11.5	17.95	.23	7	88.3	34.44	78.3	74.7	67.47	.97	1
68	14.9	11.3	17.95	.23	7	88.4	34.93	78.4	74.9	68.46	.97	1
69	14.7	11.2	17.95	.22	7	88.4	35.42	78.6	75.1	69.45	.97	1
70	14.4	11.0	17.95	.22	7	88.4	35.90	78.7	75.3	70.45	.97	1
71	14.2	10.9	17.95	.22	7	88.4	36.39	78.9	75.5	71.44	.97	1
72	14.0	10.7	17.95	.21	7	88.4	36.88	79.0	75.7	72.43	.97	1
73	13.8	10.6	17.95	.21	7	88.5	37.37	79.2	75.9	73.43	.97	1
74	13.7	10.5	17.95	.21	7	88.5	37.85	79.3	76.1	74.42	.97	1
75	13.5	10.3	17.96	.21	7	88.5	38.34	79.5	76.3	75.42	.98	1

16 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
76	13.3	10.2	17.96	.20	7	88.5	38.83	79.6	76.4	76.41	.98	1
77	13.1	10.0	17.96	.20	7	88.5	39.31	79.7	76.6	77.41	.98	1
78	13.0	9.9	17.96	.20	7	88.6	39.81	79.9	76.8	78.40	.98	1
79	12.8	9.8	17.96	.20	7	88.6	40.30	80.0	77.0	79.40	.98	1
80	12.7	9.7	17.96	.19	7	88.6	40.79	80.1	77.1	80.39	.98	1
81	12.5	9.6	17.96	.19	7	88.6	41.28	80.2	77.3	81.39	.98	1
82	12.3	9.5	17.96	.19	7	88.6	41.77	80.3	77.4	82.38	.98	1
83	12.2	9.3	17.96	.19	7	88.6	42.26	80.5	77.6	83.38	.98	1
84	12.1	9.2	17.96	.18	7	88.7	42.75	80.6	77.7	84.37	.98	1
85	11.9	9.1	17.97	.18	7	88.7	43.25	80.7	77.8	85.37	.98	1
86	11.8	9.0	17.97	.18	7	88.7	43.74	80.8	78.0	86.37	.98	1
87	11.7	8.9	17.97	.18	7	88.7	44.23	80.9	78.1	87.36	.98	1
88	11.5	8.8	17.97	.18	7	88.7	44.72	81.0	78.3	88.36	.98	1
89	11.4	8.7	17.97	.17	7	88.7	45.21	81.1	78.4	89.35	.98	1
90	11.3	8.6	17.97	.17	7	88.7	45.71	81.2	78.5	90.35	.98	1
91	11.2	8.5	17.97	.17	7	88.8	46.20	81.3	78.6	91.35	.98	1
92	11.0	8.4	17.97	.17	7	88.8	46.69	81.4	78.8	92.34	.98	1
93	10.9	8.3	17.97	.17	7	88.8	47.18	81.5	78.9	93.34	.98	1
94	10.8	8.2	17.97	.17	7	88.8	47.68	81.6	79.0	94.34	.98	1
95	10.7	8.1	17.97	.16	7	88.8	48.17	81.7	79.1	95.33	.98	1
96	10.6	8.1	17.97	.16	7	88.8	48.66	81.7	79.2	96.33	.98	1
97	10.5	8.0	17.97	.16	7	88.8	49.16	81.8	79.3	97.33	.98	1
98	10.4	7.9	17.97	.16	7	88.8	49.65	81.9	79.4	98.32	.98	1
99	10.3	7.8	17.97	.16	7	88.9	50.19	82.0	79.5	99.32	.98	1
100	10.2	7.7	17.97	.16	7	88.9	50.63	82.1	79.6	100.32	.98	1
101	10.1	7.7	17.97	.15	7	88.9	51.13	82.1	79.7	101.31	.98	1
102	10.0	7.6	17.98	.15	7	88.9	51.62	82.2	79.8	102.31	.99	1
103	9.9	7.5	17.98	.15	7	88.9	52.12	82.3	79.9	103.31	.99	1
104	9.8	7.5	17.98	.15	7	88.9	52.61	82.4	80.0	104.30	.99	1
105	9.7	7.4	17.98	.15	7	88.9	53.11	82.4	80.1	105.30	.99	1

16

PINIO

15 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM
45	20.9	15.6	1
46	20.4	15.3	16
47	20.0	15.0	16
48	19.6	14.7	16
49	19.2	14.4	16
50	18.9	14.1	16
51	18.5	13.9	16
52	18.2	13.6	16
53	17.9	13.4	16
54	17.5	13.1	16
55	17.2	12.9	16
56	17.0	12.7	16
57	16.7	12.5	16
58	16.4	12.2	16
59	16.1	12.1	16
60	15.9	11.9	16
61	15.6	11.7	16
62	15.4	11.5	16
63	15.1	11.3	16
64	14.9	11.1	16
65	14.7	11.0	16
66	14.5	10.8	16
67	14.3	10.7	16
68	14.1	10.5	16
69	13.9	10.4	1
70	13.6	10.2	16
71	13.4	10.1	1
72	13.2	9.9	16
73	13.0	9.8	16
74	12.9	9.7	1

	PINION					PINION AND GEAR		GEAR				
17 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
17	49.7	39.5	18.41	.70	5	85.2	12.02					
18	48.0	38.0	18.45	.68	5	85.4	12.38	51.2	41.3	19.37	.72	4
19	46.3	36.6	18.49	.66	5	85.5	12.75	52.7	43.0	20.33	.74	4
20	44.7	35.3	18.52	.64	5	85.6	13.12	54.0	44.6	21.29	.76	4
21	43.3	34.1	18.55	.63	5	85.7	13.51	55.2	46.1	22.26	.77	4
22	41.8	32.9	18.58	.61	5	85.9	13.90	56.4	47.5	23.22	79	3
23	40.5	31.8	18.61	.59	5	86.0	14.34	57.5	48.9	24.19	.80	3
24	39.2	30.8	18.63	.58	6	86.1	14.71	58.6	50.2	25.16	.81	3
25	38.0	29.8	18.66	.56	6	86.2	15.12	59.6	51.4	26.12	.83	3
26	36.9	28.9	18.68	.54	6	86.3	15.53	60.5	52.5	27.09	.84	3
27	35.8	28.0	18.69	.53	6	86.4	15.95	61.4	53.6	28.07	.84	3
28	34.8	27.2	18.71	.52	6	86.5	16.38	62.2	54.7	29.04	.85	2
29	33.8	26.4	18.73	.50	6	86.6	16.81	63.0	55.7	30.01	.86	2
30	32.9	25.7	18.74	.49	6	86.7	17.24	63.8	56.6	30.99	.87	2
31	32.0	25.0	18.75	.48	6	86.8	17.68	64.5	57.5	31.96	.87	2
32	31.2	24.3	18.77	.47	6	86.8	18.12	65.2	58.4	32.94	.88	2
33	30.3	23.7	18.78	.46	6	86.9	18.56	65.9	59.2	33.92	.89	2
34	29.6	23.1	18.79	.45	6	87.0	19.01	66.5	60.0	34.90	.89	2
35	28.8	22.5	18.80	.44	6	87.1	19.45	67.0	60.7	35.88	.90	2
36	28.1	21.9	18.81	.43	6	87.1	19.91	67.6	61.4	36.86	.90	2
37	27.5	21.4	18.82	.42	6	87.2	20.36	68.1	62.1	37.84	.91	2
38	26.8	20.9	18.83	.41	6	87.2	20.81	68.7	62.7	38.82	.91	2
39	26.2	20.4	18.83	.40	6	87.3	21.27	69.1	63.4	39.80	.91	2
40	25.6	20.0	18.84	.39	6	87.4	21.73	69.6	64.0	40.78	.92	2
41	25.1	19.5	18.85	.38	6	87.4	22.19	70.0	64.5	41.77	.92	2
42	24.5	19.1	18.85	.37	6	87.5	22.65	70.5	65.1	42.75	.92	2
43	24.0	18.7	18.86	.36	6	87.5	23.12	70.9	65.6	43.73	.93	2
44	23.5	18.3	18.87	.36	6	87.6	23.58	71.3	66.1	44.72	.93	2
45	23.0	17.9	18.87	.35	6	87.6	24.05	71.7	66.6	45.71	.93	2
46	22.6	17.6	18.88	.34	6	87.7	24.52	72.1	67.0	46.69	.94	1

16 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
106	9.6	7.3	17.98	.15	7	88.9	53.60	82.5	80.2	106.30	.99	1
107	9.5	7.3	17.98	.15	7	88.9	54.09	82.6	80.3	107.30	.99	1
108	9.4	7.2	17.98	.14	7	88.9	54.59	82.6	80.4	108.29	.99	1
109	9.4	7.1	17.98	.14	7	89.0	55.08	82.7	80.5	109.29	.99	1
110	9.3	7.0	17.98	.14	7	89.0	55.58	82.8	80.6	110.29	.99	1
111	9.2	7.0	17.98	.14	7	89.0	56.07	82.8	80.7	111.29	.99	1
112	9.1	6.9	17.98	.14	7	89.0	56.57	82.9	80.7	112.28	.99	1
113	9.0	6.9	17.98	.14	7	89.0	57.06	83.0	80.8	113.28	.99	1
114	8.9	6.8	17.98	.14	7	89.0	57.56	83.0	80.9	114.28	.99	1
115	8.9	6.8	17.98	.14	7	89.0	58.05	83.1	81.0	115.28	.99	1
116	8.8	6.7	17.98	.13	7	89.0	58.55	83.1	81.1	116.27	.99	1
117	8.7	6.7	17.98	.13	7	89.0	59.04	83.2	81.1	117.27	.99	1
118	8.6	6.6	17.98	.13	7	89.0	59.54	83.3	81.2	118.27	.99	1
119	8.5	6.5	17.98	.13	7	89.0	60.03	83.3	81.3	119.27	.99	1
120	8.5	6.5	17.98	.13	7	89.0	60.53	83.4	81.4	120.26	.99	1
121	8.4	6.4	17.98	.13	7	89.1	61.03	83.4	81.4	121.26	.99	1
122	8.4	6.4	17.98	.13	7	89.1	61.52	83.5	81.5	122.26	.99	1
123	8.3	6.3	17.98	.13	7	89.1	62.02	83.5	81.5	123.26	.99	1
124	8.2	6.3	17.98	.13	7	89.1	62.51	83.6	81.6	124.26	.99	1
125	8.2	6.2	17.98	.12	7	89.1	63.01	83.6	81.7	125.25	.99	1
126	8.1	6.2	17.98	.12	7	89.1	63.50	83.7	81.8	126.25	.99	1
127	8.0	6.1	17.98	.12	7	89.1	64.00	83.7	81.8	127.25	.99	1
128	8.0	6.1	17.98	.12	7	89.1	64.50	83.8	81.9	128.25	.99	1
129	7.9	6.0	17.98	.12	7	89.1	65.00	83.8	82.0	129.25	.99	1
130	7.9	6.0	17.98	.12	7	89.1	65.49	83.9	82.0	130.24	.99	1
131	7.8	5.9	17.98	.12	7	89.1	65.99	83.9	82.1	131.24	.99	1
132	7.7	5.9	17.99	.12	7	89.1	66.48	84.0	82.1	132.24	.99	1

17 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
17	49.7	39.5	18.41	.70	5	85.2	12.02					
18	48.0	38.0	18.45	.68	5	85.4	12.38	51.2	41.3	19.37	.72	4
19	46.3	36.6	18.49	.66	5	85.5	12.75	52.7	43.0	20.33	.74	4
20	44.7	35.3	18.52	.64	5	85.6	13.12	54.0	44.6	21.29	.76	4
21	43.3	34.1	18.55	.63	5	85.7	13.51	55.2	46.1	22.26	.77	4
22	41.8	32.9	18.58	.61	5	85.9	13.90	56.4	47.5	23.22	79	3
23	40.5	31.8	18.61	.59	5	86.0	14.34	57.5	48.9	24.19	.80	3
24	39.2	30.8	18.63	.58	6	86.1	14.71	58.6	50.2	25.16	.81	3
25	38.0	29.8	18.66	.56	6	86.2	15.12	59.6	51.4	26.12	.83	3
26	36.9	28.9	18.68	.54	6	86.3	15.53	60.5	52.5	27.09	.84	3
27	35.8	28.0	18.69	.53	6	86.4	15.95	61.4	53.6	28.07	.84	3
28	34.8	27.2	18.71	.52	6	86.5	16.38	62.2	54.7	29.04	.85	2
29	33.8	26.4	18.73	.50	6	86.6	16.81	63.0	55.7	30.01	.86	2
30	32.9	25.7	18.74	.49	6	86.7	17.24	63.8	56.6	30.99	.87	2
31	32.0	25.0	18.75	.48	6	86.8	17.68	64.5	57.5	31.96	.87	2
32	31.2	24.3	18.77	.47	6	86.8	18.12	65.2	58.4	32.94	.88	2
33	30.3	23.7	18.78	.46	6	86.9	18.56	65.9	59.2	33.92	.89	2
34	29.6	23.1	18.79	.45	6	87.0	19.01	66.5	60.0	34.90	.89	2
35	28.8	22.5	18.80	.44	6	87.1	19.45	67.0	60.7	35.88	.90	2
36	28.1	21.9	18.81	.43	6	87.1	19.91	67.6	61.4	36.86	.90	2
37	27.5	21.4	18.82	.42	6	87.2	20.36	68.1	62.1	37.84	.91	2
38	26.8	20.9	18.83	.41	6	87.2	20.81	68.7	62.7	38.82	.91	2
39	26.2	20.4	18.83	.40	6	87.3	21.27	69.1	63.4	39.80	.91	2
40	25.6	20.0	18.84	.39	6	87.4	21.73	69.6	64.0	40.78	.92	2
41	25.1	19.5	18.85	.38	6	87.4	22.19	70.0	64.5	41.77	.92	2
42	24.5	19.1	18.85	.37	6	87.5	22.65	70.5	65.1	42.75	.92	2
43	24.0	18.7	18.86	.36	6	87.5	23.12	70.9	65.6	43.73	.93	2
44	23.5	18.3	18.87	.36	6	87.6	23.58	71.3	66.1	44.72	.93	2
45	23.0	17.9	18.87	.35	6	87.6	24.05	71.7	66.6	45.71	.93	2
46	22.6	17.6	18.88	.34	6	87.7	24.52	72.1	67.0	46.69	.94	1

17 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
47	22.2	17.2	18.88	.34	G	87.7	24.99	72.4	67.5	47.68	.94	1
48	21.8	16.9	18.89	.33	G	87.7	25.46	72.8	67.9	48.67	.94	1
49	21.3	16.6	18.89	.32	G	87.8	25.93	73.1	68.3	49.65	.94	1
50	20.9	16.3	18.89	.32	G	87.8	26.40	73.4	68.7	50.64	.94	1
51	20.6	16.0	18.90	.31	G	87.9	26.88	73.7	69.1	51.63	.95	1
52	20.2	15.7	18.90	.31	G	87.9	27.35	74.0	69.5	52.62	.95	1
53	19.8	15.4	18.90	.30	G	87.9	27.83	74.3	69.9	53.61	.95	1
54	19.5	15.1	18.91	.30	G	88.0	28.31	74.6	70.2	54.60	.95	1
55	19.1	14.9	18.91	.29	G	88.0	28.78	74.8	70.6	55.59	.95	1
56	18.8	14.6	18.91	.29	G	88.0	29.26	75.1	70.9	56.58	.95	1
57	18.5	14.4	18.92	.28	G	88.1	29.74	75.3	71.2	57.57	.96	1
58	18.2	14.1	18.92	.28	G	88.1	30.22	75.6	71.5	58.56	.96	1
59	17.9	13.9	18.92	.27	G	88.1	30.70	75.8	71.8	59.55	.96	1
60	17.6	13.7	18.92	.27	G	88.2	31.18	76.0	72.1	60.54	.96	1
61	17.4	13.5	18.93	.27	G	88.2	31.66	76.2	72.4	61.54	.96	1
62	17.1	13.2	18.93	.26	G	88.2	32.14	76.5	72.6	62.53	.96	1
63	16.8	13.0	18.93	.26	G	88.2	32.63	76.7	72.9	63.52	.96	1
64	16.6	12.8	18.93	.25	G	88.3	33.11	76.9	73.1	64.51	.96	1
65	16.3	12.6	18.93	.25	G	88.3	33.59	77.1	73.4	65.50	.96	1
66	16.1	12.5	18.94	.25	G	88.3	34.08	77.3	73.6	66.50	.97	1
67	15.9	12.3	18.94	.24	G	88.3	34.56	77.5	73.9	67.49	.97	1
68	15.7	12.1	18.94	.24	G	88.4	35.05	77.6	74.1	68.48	.97	1
69	15.4	12.0	18.94	.24	G	88.4	35.53	77.8	74.3	69.48	.97	1
70	15.2	11.8	18.94	.23	G	88.4	36.02	78.0	74.6	70.47	.97	1
71	15.0	11.6	18.95	.23	G	88.4	36.50	78.1	74.8	71.46	.97	1
72	14.8	11.4	18.95	.23	G	88.4	36.99	78.3	75.0	72.46	.97	1
73	14.6	11.3	18.95	.22	G	88.5	37.48	78.5	75.2	73.45	.97	1
74	14.4	11.2	18.95	.22	G	88.5	37.96	78.6	75.4	74.45	.97	1
75	14.2	11.0	18.95	.22	G	88.5	38.45	78.8	75.6	75.44	.97	1
76	14.0	10.9	18.95	.22	G	88.5	38.94	78.9	75.8	76.44	.97	1

	PINION					PINION AND GEAR		GEAR				
17 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
77	13.8	10.7	18.95	.21	G	88.5	39.43	79.0	75.9	77.43	.97	1
78	13.6	10.6	18.95	.21	G	88.6	39.92	79.2	76.1	78.43	.97	1
79	13.5	10.5	18.95	.21	G	88.6	40.40	79.3	76.3	79.42	.97	1
80	13.3	10.4	18.96	.21	G	88.6	40.89	79.4	76.5	80.42	.98	1
81	13.2	10.2	18.96	.20	G	88.6	41.38	79.5	76.6	81.41	.98	1
82	13.0	10.1	18.96	.20	G	88.6	41.87	79.7	76.8	82.41	.98	1
83	12.8	10.0	18.96	.20	G	88.6	42.36	79.8	77.0	83.40	.98	1
84	12.7	9.9	18.96	.20	G	88.7	42.85	79.9	77.1	84.40	.98	1
85	12.5	9.8	18.96	.19	G	88.7	43.34	80.0	77.3	85.39	.98	1
86	12.4	9.6	18.96	.19	G	88.7	43.83	80.1	77.4	86.39	.98	1
87	12.3	9.5	18.96	.19	G	88.7	4432	80.3	77.5	87.38	.98	1
88	12.1	9.4	18.96	.19	G	88.7	44.81	80.4	77.7	88.38	.98	1
89	12.0	9.3	18.96	.18	G	88.7	4530	80.5	77.8	89.37	.98	1
90	11.9	9.2	18.97	.18	G	88.7	45.80	80.6	77.9	90.37	.98	1
91	11.7	9.1	18.97	.18	G	88.8	46.29	80.7	78.1	91.37	.98	1
92	11.6	9.0	18.97	.18	G	88.8	46.78	80.8	78.2	92.36	.98	1
93	11.5	8.9	18.97	.18	G	88.8	47.27	80.9	78.3	93.36	.98	1
94	11.4	8.8	18.97	.17	G	88.8	47.76	81.0	78.5	94.35	.98	1
95	11.3	8.7	18.97	.17	G	88.8	48.25	81.1	78.6	95.35	.98	1
96	11.1	8.6	18.97	.17	G	88.8	48.75	81.2	78.7	96.35	.98	1
97	11.0	8.6	18.97	.17	G	88.8	49.24	81.3	78.8	97.34	.98	1
98	10.9	8.5	18.97	.17	G	88.9	49.73	81.4	78.9	98.34	.98	1
99	10.8	8.4	18.97	.17	G	88.9	50.22	81.5	79.0	99.34	.98	1
100	10.7	8.3	18.97	.17	G	88.9	50.72	81.5	79.1	100.34	.98	1
101	10.6	8.2	18.97	.16	G	88.9	51.21	81.6	79.2	101.33	.98	1
102	10.5	8.2	18.97	.16	G	88.9	51.70	81.7	79.3	102.33	.98	1
103	10.4	8.1	18.97	.16	G	88.9	52.20	81.8	79.4	103.33	.98	1
104	10.3	8.0	18.97	.16	G	88.9	52.69	81.9	79.5	104.32	.98	1
105	10.2	7.9	18.97	.16	G	88.9	53.18	81.9	79.6	105.32	.98	1
106	10.1	7.8	18.97	16	G	88.9	53.68	82.0	79.7	106.32	.98	1

17 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
107	10.0	7.8	18.97	.15	6	88.9	54.17	82.1	79.8	107.31	.98	1
108	9.9	7.7	18.98	.15	6	88.9	54.66	82.2	79.9	108.31	.99	1
109	9.8	7.6	18.98	.15	6	89.0	55.16	82.2	80.0	109.31	.99	1
110	9.8	7.5	18.98	.15	6	89.0	55.65	82.3	80.1	110.31	.99	1
111	9.7	7.5	18.98	.15	6	89.0	56.15	82.4	80.2	111.30	.99	1
112	9.6	7.4	18.98	.15	6	89.0	56.64	82.4	80.3	112.30	.99	1
113	9.5	7.4	18.98	.15	6	89.0	57.14	82.5	80.3	113.30	.99	1
114	9.4	7.3	18.98	.14	6	89.0	57.63	82.6	80.4	114.29	.99	1
115	9.3	7.2	18.98	.14	6	89.0	58.12	82.6	80.5	115.29	.99	1
116	9.2	7.2	18.98	.14	6	89.0	58.62	82.7	80.6	116.29	.99	1
117	9.2	7.1	18.98	.14	6	89.0	59.11	82.7	80.7	117.29	.99	1
118	9.1	7.0	18.98	.14	6	89.0	59.61	82.8	80.8	118.28	.99	1
119	9.0	7.0	18.98	.14	6	89.0	60.10	82.9	80.8	119.28	.99	1
120	9.0	6.9	18.98	.14	6	89.1	60.60	82.9	80.9	120.28	.99	1
121	8.9	6.8	18.98	.14	6	89.1	61.09	83.0	81.0	121.28	.99	1
122	8.8	6.8	18.98	.14	6	89.1	61.59	83.0	81.0	122.28	.99	1
123	8.7	6.7	18.98	.13	6	89.1	62.08	83.1	81.1	123.27	.99	1
124	8.7	6.7	18.98	.13	6	89.1	62.58	83.1	81.2	124.27	.99	1
125	8.6	6.6	18.98	.13	6	89.1	63.08	83.2	81.3	125.27	.99	1
126	8.5	6.6	18.98	.13	6	89.1	63.57	83.3	81.3	126.27	.99	1
127	8.5	6.5	18.98	.13	6	89.1	64.07	83.3	81.4	127.27	.99	1
128	8.4	6.5	18.98	.13	6	89.1	64.56	83.4	81.5	128.26	.99	1
129	8.3	6.5	18.98	.13	6	89.1	65.06	83.4	81.5	129.26	.99	1
130	8.3	6.4	18.98	.13	6	89.1	65.55	83.5	81.6	130.26	.99	1
131	8.2	6.4	18.98	.13	6	89.1	66.05	83.5	81.7	131.26	.99	1
132	8.1	6.3	18.98	.13	6	89.1	66.54	83.6	81.7	132.26	.99	1

18 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
18	49.5	39.8	19.41	.70	5	85.5	12.73					
19	47.8	38.4	19.45	.69	5	85.6	13.09	50.9	41.5	20.38	.72	4
20	46.2	37.1	19.49	.67	5	85.7	13.45	52.2	43.1	21.34	.74	4
21	44.7	35.8	19.52	.65	5	85.8	13.83	53.5	44.6	22.30	.76	4
22	43.3	34.6	19.55	.63	5	86.0	14.21	54.7	46.1	23.26	.77	3
23	41.9	33.5	19.58	.61	5	86.1	14.60	55.9	47.5	24.23	.79	3
24	40.7	32.5	19.60	.60	5	86.2	15.00	56.9	48.7	25.20	.80	3
25	39.5	31.4	19.63	.58	5	86.3	15.40	58.0	50.0	26.17	.81	3
26	38.3	30.5	19.65	.57	5	86.4	15.81	58.9	51.1	27.14	82	3
27	37.2	29.6	19.67	.55	5	86.5	16.13	59.8	52.2	28.11	.83	3
28	36.2	28.7	19.68	.54	5	86.6	16.64	60.7	53.3	29.08	.84	3
29	35.2	27.9	19.70	.53	5	86.6	17.04	61.5	54.3	30.06	.85	2
30	34.2	27.1	19.72	.51	6	86.7	17.49	62.3	55.3	31.03	.86	2
31	33.3	26.4	19.73	.50	6	86.8	17.92	63.1	56.2	32.01	.86	2
32	32.5	25.7	19.74	.49	6	86.9	18.36	63.8	57.0	32.98	.87	2
33	31.6	25.1	19.76	.48	6	86.9	18.79	64.4	57.9	33.96	.88	2
34	30.9	24.4	19.77	.47	6	87.0	19.24	65.1	58.7	34.94	.88	2
35	30.1	23.9	19.78	.46	6	87.1	19.68	65.7	59.4	35.92	.89	2
36	29.4	23.3	19.79	.45	6	87.2	20.12	66.3	60.1	36.90	.89	2
37	28.7	22.7	19.80	.44	6	87.2	20.57	66.8	60.9	37.88	.90	2
38	28.1	22.2	19.81	.43	6	87.3	21.02	67.4	61.5	38.86	.90	2
39	27.5	21.7	19.82	.42	6	87.3	21.48	67.9	62.2	39.84	.91	2
40	26.9	21.2	19.82	.41	6	87.4	21.93	68.4	62.8	4082	.91	2
41	26.3	20.8	19.83	.40	6	87.4	22.39	68.8	63.3	41.81	.91	2
42	25.7	20.3	19.84	.39	6	87.5	22.85	69.3	63.9	42.79	.92	2
43	25.2	19.9	19.85	.38	6	87.5	23.31	69.7	64.5	43.77	.92	2
44	24.7	19.5	19.85	.38	6	87.6	23.77	70.2	65.0	44.76	.92	2
45	24.2	19.1	19.86	.37	6	87.6	24.23	70.6	65.5	45.74	.93	2
46	23.7	18.7	19.86	.36	6	87.7	24.70	71.0	66.0	46.73	.93	2
47	23.2	18.3	19.87	.35	6	87.7	25.16	71.3	66.4	47.71	.93	2

	PINION					PINION AND GEAR		GEAR				
18 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
48	22.8	18.0	19.87	.35	G	87.8	25.63	71.7	66.9	48.70	.93	1
49	22.4	17.6	19.88	.34	G	87.8	26.10	72.0	67.3	49.69	.94	1
50	22.0	17.3	19.88	.34	G	87.8	26.57	72.4	67.7	50.68	.94	1
51	21.6	17.0	19.89	.33	G	87.9	27.04	72.7	68.1	51.66	.94	1
52	21.2	16.7	19.89	.32	G	87.9	27.51	73.0	68.5	52.65	.94	1
53	20.8	16.4	19.89	.32	G	87.9	27.99	73.3	68.9	53.64	.94	1
54	20.4	16.1	19.90	.31	G	88.0	28.46	73.6	69.3	54.63	.95	1
55	20.1	15.8	19.90	.31	G	88.0	28.93	73.8	69.6	55.62	.95	1
56	19.7	15.5	19.90	.30	G	88.0	29.41	74.1	70.0	56.61	.95	1
57	19.4	15.3	19.91	.30	G	88.1	29.89	74.4	70.3	57.60	.95	1
58	19.1	15.0	19.91	.29	G	88.1	30.36	74.6	70.6	58.59	.95	1
59	18.8	14.8	19.91	.29	G	88.1	30.84	74.9	70.9	59.58	.95	1
60	18.5	14.6	19.92	.28	G	88.2	31.32	75.1	71.2	60.57	.96	1
61	18.2	14.4	19.92	.28	G	88.2	31.80	75.4	71.5	61.57	.96	1
62	17.9	14.1	19.92	.28	G	88.2	32.28	75.6	71.8	62.56	.96	1
63	17.7	13.9	19.92	.27	G	88.2	32.76	75.8	72.0	63.55	.96	1
64	17.4	13.7	19.92	.27	G	88.3	33.24	76.0	72.3	64.54	.96	1
65	17.2	13.5	19.93	.26	G	88.3	33.72	76.2	72.6	65.53	.96	1
66	16.9	13.3	19.93	.26	G	88.3	34.21	76.4	72.8	66.53	.96	1
67	16.7	13.1	19.93	.26	G	88.3	34.69	76.6	73.1	67.52	.96	1
68	16.5	12.9	19.93	.25	G	88.4	35.17	76.8	73.3	68.51	.96	1
69	16.2	12.7	19.93	.25	G	88.4	35.65	77.0	73.5	69.51	.96	1
70	16.0	12.6	19.94	.25	G	88.4	36.14	77.2	73.8	70.50	.97	1
71	15.8	12.4	19.94	.24	G	88.4	36.62	77.4	74.0	71.49	.97	1
72	15.6	12.2	19.94	.24	G	88.4	37.11	77.5	74.2	72.49	.97	1
73	15.4	12.1	19.94	.24	G	88.5	37.59	77.7	74.4	73.48	.97	1
74	15.1	11.9	19.94	.23	G	88.5	38.08	77.8	74.6	74.47	.97	1
75	15.0	11.8	19.94	.23	G	88.5	38.56	78.0	74.8	75.47	.97	1
76	14.8	11.6	19.95	.23	G	88.5	39.05	78.1	75.0	76.46	.97	1
77	14.6	11.5	19.95	23	G	88.5	39.54	78.3	75.2	77.46	.97	1

18 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
78	14.4	11.3	19.95	.22	G	88.6	40.02	78.4	75.4	78.45	.97	1
79	14.2	11.2	19.95	.22	G	88.6	40.51	78.6	75.6	79.45	.97	1
80	14.0	11.1	19.95	.22	G	88.6	41.00	78.7	75.8	80.44	.97	1
81	13.9	11.0	19.95	.22	G	88.6	41.49	78.9	75.9	81.44	.97	1
82	13.7	10.8	19.95	.21	G	88.6	41.98	79.0	76.1	82.43	.97	1
83	13.5	10.7	19.95	.21	G	88.7	42.46	79.1	76.3	83.43	.97	1
84	13.4	10.6	19.95	.21	G	88.7	42.95	79.2	76.4	84.42	.97	1
85	13.2	10.5	19.96	.21	G	88.7	43.44	79.4	76.6	85.42	.98	1
86	13.1	10.3	19.96	20	G	88.7	43.93	79.5	76.7	86.41	.98	1
87	12.9	10.2	19.96	.20	G	88.7	44.42	79.6	76.9	87.41	.98	1
88	12.8	10.1	19.96	20	G	88.7	44.91	79.7	77.0	88.40	.98	1
89	12.6	10.0	19.96	20	G	88.7	45.40	79.8	77.2	89.40	.98	1
90	12.5	9.9	19.96	.19	G	88.7	45.89	80.0	77.3	90.39	.98	1
91	12.4	9.8	19.96	.19	G	88.8	46.38	80.0	77.4	91.39	.98	1
92	12.2	9.7	19.96	.19	G	88.8	46.87	80.2	77.6	92.38	.98	1
93	12.1	9.6	19.96	.19	G	88.8	47.36	80.3	77.7	93.38	.98	1
94	12.0	9.5	19.96	.19	G	88.8	47.85	80.4	77.8	94.38	.98	1
95	11.9	9.3	19.96	.18	G	88.8	48.34	80.5	78.0	95.37	.98	1
96	11.7	9.2	19.97	.18	G	88.8	48.84	80.6	78.1	96.37	.98	1
97	11.6	9.1	19.97	.18	G	88.8	49.33	80.7	78.2	97.37	.98	1
98	11.5	9.0	19.97	.18	G	88.9	49.82	80.8	78.3	98.36	.98	1
99	11.4	9.0	19.97	.18	G	88.9	50.31	80.9	78.4	99.36	.98	1
100	11.3	8.9	19.97	.17	G	88.9	50.80	80.9	78.5	100.35	.98	1
101	11.2	8.8	19.97	.17	G	88.9	51.30	81.0	78.6	101.35	.98	1
102	11.1	8.7	19.97	.17	G	88.9	51.79	81.1	78.7	102.35	.98	1
103	11.0	8.6	19.97	.17	G	88.9	52.28	81.2	78.8	103.35	.98	1
104	10.9	8.5	19.97	.17	G	88.9	52.77	81.3	79.0	104.34	.98	1
105	10.8	8.5	19.97	.17	G	88.9	53.27	81.4	79.1	105.34	.98	1
106	10.7	8.4	19.97	.17	G	88.9	53.76	81.4	79.2	106.34	.98	1
107	10.6	8.3	19.97	.16	G	88.9	54.25	81.5	79.3	107.33	.98	1

	PINION					PINION AND GEAR		GEAR				
18 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
108	10.5	8.3	19.97	.16	G	88.9	54.74	81.6	79.4	108.33	.98	1
109	10.4	8.2	19.97	.16	G	89.0	55.24	81.7	79.4	109.33	.98	1
110	10.3	8.1	19.97	.16	G	89.0	55.73	81.8	79.5	110.32	.98	1
111	10.2	8.0	19.97	.16	G	89.0	56.22	81.8	79.6	111.32	.98	1
112	10.1	8.0	19.97	.16	G	89.0	56.72	81.9	79.7	112.32	.98	1
113	10.0	7.9	19.97	.15	G	89.0	57.21	82.0	79.8	113.31	.98	1
114	9.9	7.8	19.97	.15	G	89.0	57.71	82.0	79.9	114.31	.98	1
115	9.8	7.8	19.98	.15	G	89.0	58.20	82.1	80.0	115.31	.99	1
116	9.7	7.7	19.98	.15	G	89.0	58.69	82.2	81.1	116.31	.99	1
117	9.7	7.6	19.98	.15	G	89.0	59.19	82.2	81.2	117.30	.99	1
118	9.6	7.5	19.98	.15	G	89.0	59.68	82.3	81.3	118.30	.99	1
119	9.5	7.5	19.98	.15	G	89.0	60.18	82.4	81.3	119.30	.99	1
120	9.5	7.4	19.98	.15	G	89.0	60.67	82.4	81.4	120.30	.99	1
121	9.4	7.4	19.98	.14	G	89.1	61.17	82.5	81.5	121.29	.99	1
122	9.3	7.3	19.98	.14	G	89.1	61.66	82.5	81.6	122.29	.99	1
123	9.2	7.2	19.98	.14	G	89.1	62.16	82.6	81.6	123.29	.99	1
124	9.2	7.2	19.98	.14	G	89.1	62.65	82.7	81.7	124.29	.99	1
125	9.1	7.1	19.98	.14	G	89.1	63.14	82.7	81.8	125.28	.99	1
126	9.0	7.1	19.98	.14	G	89.1	63.64	82.8	81.9	126.28	.99	1
127	8.9	7.0	19.98	.14	G	89.1	64.13	82.8	81.9	127.28	.99	1
128	8.9	7.0	19.98	.14	G	89.1	64.63	82.9	82.0	128.28	.99	1
129	8.8	6.9	19.98	.14	G	89.1	65.12	83.0	82.1	129.28	.99	1
130	8.7	6.9	19.98	.13	G	89.1	65.62	83.0	82.1	130.27	.99	1
131	8.7	6.8	19.98	.13	G	89.1	66.12	83.0	82.2	131.27	.99	1
132	8.6	6.8	19.98	.13	G	89.1	66.61	83.1	82.3	132.27	.99	1

	PINION					PINION AND GEAR		GEAR				
19 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
19	49.2	40.1	20.41	.70	4	85.7	13.43					
20	47.7	38.8	20.45	.69	5	85.8	13.79	50.6	41.7	21.38	.72	4
21	46.2	37.5	20.48	.67	5	86.0	14.16	51.8	43.2	22.34	.74	4
22	44.7	36.3	20.51	.65	5	86.1	14.54	53.1	44.7	23.31	.75	4
23	43.3	35.2	20.54	.63	5	86.2	14.92	54.2	46.1	24.27	.77	3
24	42.1	34.1	20.57	62	5	86.3	15.30	55.3	47.4	25.24	.78	3
25	40.8	33.1	20.59	.60	5	86.3	15.70	56.3	48.6	26.21	.79	3
26	39.7	32.1	20.62	.59	5	86.4	16.10	57.4	49.8	27.18	.81	3
27	38.6	31.2	20.64	.57	5	86.5	16.51	58.3	50.9	28.15	.82	3
28	37.5	30.3	20.66	.56	5	86.6	16.92	59.2	52.0	29.12	.83	3
29	36.5	29.4	20.67	.55	5	86.7	17.33	60 0	53.0	30.10	.83	3
30	35.5	28.6	20.69	.53	5	86.8	17.75	60.8	53.9	31.07	.84	2
31	34.6	27.9	20.71	.52	5	86.8	18.18	61.6	54.9	32.05	.85	2
32	33.7	27.1	20.72	.51	5	86 9	18 61	62 4	55.8	33.02	.86	2
33	32 9	26.5	20.73	.50	5	87.0	19.04	63.0	56.6	34.00	.86	2
34	32.1	25.8	20.75	.49	5	87.1	19.47	63 7	57.4	34 98	.87	2
35	31.3	25.2	20.76	.47	5	87.1	19 91	64.3	58.2	35.95	88	2
36	30.6	24.6	20.77	.46	5	87.2	20.35	64.8	58.9	36 93	.88	2
37	29.9	24.0	20.78	.45	5	87.2	20.80	65.5	59.7	37.91	.89	2
38	29.2	23.5	20.79	.45	5	87 3	21.24	66.1	60.3	38.90	89	2
39	28.6	22.9	20.80	.44	5	87.4	21 69	66.6	61.0	39 88	.90	2
40	28.0	22.4	20.81	.43	5	87.4	22.14	67.1	61 6	40.86	40	2
41	27.4	21.9	20.82	.42	6	87.5	22 59	67.6	62 2	41 84	.91	2
42	26.8	21.5	20.82	.41	6	87.5	23.05	68.1	62.8	42 83	.91	2
43	26.2	21.0	20.83	.40	6	87.6	23.50	68.6	63.4	43.81	.91	2
44	25.7	20.6	20.84	39	6	87.6	23.96	69.0	63 9	44 79	.92	2
45	25.2	20.2	20.84	.39	6	87.7	24.42	69.4	64 4	45.78	.92	2
46	24.7	19 8	20 85	38	6	87.7	24.88	69 8	64.9	46.76	92	2
47	24.2	19 4	20.85	37	6	87.7	25.35	70.2	65.4	47 75	92	2
48	23.8	19.0	20.86	.37	6	87.8	25.81	70 6	65.9	48.74	.93	2

19 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH DIVIDE BY PITCH	NO OF CUTTER TO USE
49	23.3	18.7	20.87	36	6	87.8	2628	71 0	66 3	49 72	93	1
50	22.9	18.3	20.87	.35	6	87.9	26.74	71 3	66.7	50 71	.93	1
51	22.5	18.0	20.87	35	6	87.9	27.21	71.7	67.1	51.70	.93	1
52	22.1	17.7	20.88	.34	6	87.9	27.68	72.0	67.5	52.69	.94	1
53	21.8	17.3	20.88	.33	6	88.0	28.15	72 3	67.9	53.67	.94	1
54	21.4	17.0	20.89	33	6	88.0	28.62	72 6	68.3	54 66	.94	1
55	21 0	16.8	20 89	32	6	88.0	29.09	72.9	68.7	55.65	.94	1
56	20.7	16.5	20.89	32	6	88.1	29.57	73 2	69.0	56 64	94	1
57	20.3	16.2	20.90	.31	6	88.1	30.04	73.5	69.4	57 63	.95	1
58	20.0	16 0	20 90	31	6	88.1	30.52	73 7	69.7	58 62	95	1
59	19.7	15.7	20.90	.30	6	88.1	30.99	74.0	70.0	59 61	.95	1
60	19.4	15.4	20.91	30	6	88.2	31.47	74.3	70.3	60.60	.95	1
61	19.1	15.2	20.91	.29	6	88.2	31.94	74.5	70.6	61.59	.95	1
62	18.8	15.0	20.91	.29	6	88.2	32.42	74 7	71.0	62.59	.95	1
63	18.5	14.8	20.91	.29	6	88.3	32.90	74 9	71.2	63.58	.95	1
64	18.2	14.5	20.92	.28	6	88.3	33.38	75 2	71.5	64.57	96	1
65	18.0	14.3	20.92	28	6	88 3	33.86	75.4	71.8	65.56	.96	1
66	17.7	14.1	20.92	.28	6	88.3	34.34	75.6	72.0	66.56	.96	1
67	17.5	13.9	20.92	27	6	88.3	34.82	75.8	72.3	67.55	.96	1
68	17.2	13.7	20.93	.27	6	88.4	35.30	76.0	72.5	68.54	.96	1
69	17.0	13.5	20.93	.26	6	88.4	35.78	76.2	72.8	69.53	.96	1
70	16.7	13.3	20.93	26	6	88.4	36.27	76.4	73.0	70.52	.96	1
71	16.5	13.1	20.93	.26	6	88.4	36.75	76.6	73.3	71.52	.96	1
72	16.3	13.0	20.93	.25	6	88.5	37.23	76.8	73.5	72.51	.96	1
73	16.0	12.8	20.93	.25	6	88.5	37.71	77.0	73.7	73.50	.96	1
74	15.8	12.6	20.94	.25	6	88.5	38.20	77.1	73.9	74.50	.97	1
75	15.6	12.5	20.94	.24	6	88.5	38.68	77.3	74.0	75.49	.97	1
76	15.4	12.3	20.94	.24	6	88.5	39.17	77.5	74.3	76.48	.97	1
77	15.2	12.2	20.94	.24	6	88.5	39.65	77.6	74.5	77.48	.97	1
78	15.0	12.0	20.94	.23	6	88.6	40.14	77.8	74.7	78.47	.97	1

	PINION					PINION AND GEAR		GEAR				
19 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
79	14.9	11.9	20.94	.23	G	88.6	40.63	77.9	74.9	79.47	.97	1
80	14.7	11.7	20.95	.23	G	88.6	41.11	78.1	75.1	80.46	.97	1
81	14.5	11.6	20.95	.23	G	88.6	41.60	78.2	75.3	81.46	.97	1
82	14.3	11.5	20.95	.22	G	88.6	42.09	78.3	75.4	82.45	.97	1
83	14.2	11.3	20.95	.22	G	88.7	42.57	78.5	75.6	83.45	.97	1
84	14.0	11.2	20.95	.22	G	88.7	43.06	78.6	75.8	84.44	.97	1
85	13.8	11.0	20.95	.22	G	88.7	43.55	78.8	75.9	85.44	.97	1
86	13.7	10.9	20.95	.21	G	88.7	44.04	78.9	76.1	86.43	.97	1
87	13.5	10.8	20.95	.21	G	88.7	44.53	79.0	76.3	87.43	.97	1
88	13.4	10.7	20.95	.21	G	88.7	45.01	79.1	76.4	88.42	.97	1
89	13.2	10.6	20.96	.21	G	88.7	45.50	79.2	76.6	89.42	.98	1
90	13.1	10.5	20.96	.20	G	88.7	45.99	79.4	76.7	90.41	.98	1
91	12.9	10.3	20.96	.20	G	88.8	46.48	79.5	76.9	91.41	.98	1
92	12.8	10.2	20.96	.20	G	88.8	46.97	79.6	77.0	92.41	.98	1
93	12.7	10.1	20.96	.20	G	88.8	47.46	79.7	77.1	93.40	.98	1
94	12.5	10.0	20.96	.20	G	88.8	47.95	79.8	77.3	94.40	.98	1
95	12.4	9.9	20.96	.19	G	88.8	48.44	79.9	77.4	95.39	.98	1
96	12.3	9.8	20.96	.19	G	88.8	48.93	80.0	77.5	96.39	.98	1
97	12.2	9.7	20.96	.19	G	88.8	49.42	80.1	77.6	97.38	.98	1
98	12.1	9.6	20.96	.19	G	88.8	49.91	80.2	77.7	98.38	.98	1
99	11.9	9.5	20.96	.19	G	88.9	50.40	80.3	77.9	99.38	.98	1
100	11.8	9.4	20.96	.18	G	88.9	50.89	80.4	78.0	100.37	.98	1
101	11.7	9.3	20.96	.18	G	88.9	51.38	80.5	78.1	101.37	.98	1
102	11.6	9.2	20.97	.18	G	88.9	51.88	80.6	78.2	102.37	.98	1
103	11.5	9.1	20.97	.18	G	88.9	52.37	80.7	78.3	103.36	.98	1
104	11.4	9.1	20.97	.18	G	88.9	52.86	80.8	78.4	104.36	.98	1
105	11.3	9.0	20.97	.18	G	88.9	53.35	80.9	78.5	105.36	.98	1
106	11.2	8.9	20.97	.17	G	88.9	53.84	80.9	78.6	106.35	.98	1
107	11.1	8.8	20.97	.17	G	88.9	54.34	81.0	78.7	107.35	.98	1
108	11.0	8.7	20.97	.17	G	88.9	54.83	81.1	78.8	108.35	.98	1

	PINION					PINION AND GEAR		GEAR				
19 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
109	10.9	8.7	20.97	.17	6	89.0	55.32	81.2	79.0	109.35	.98	1
110	10.8	8.6	20.97	.17	6	89.0	55.81	81.3	79.1	110.34	.98	1
111	10.7	8.5	20.97	.17	6	89.0	56.30	81.4	79.2	111.34	.98	1
112	10.6	8.4	20.97	.17	6	89.0	56.80	81.4	79.3	112.34	.98	1
113	10.5	8.4	20.97	.16	6	89.0	57.29	81.5	79.4	113.33	.98	1
114	10.4	8.3	20.97	.16	6	89.0	57.79	81.6	79.5	114.33	.98	1
115	10.3	8.2	20.97	.16	6	89.0	58.28	81.6	79.5	115.33	.98	1
116	10.2	8.1	20.97	.16	6	89.0	58.77	81.7	79.6	116.32	.98	1
117	10.1	8.1	20.97	.16	6	89.0	59.27	81.8	79.7	117.32	.98	1
118	10.0	8.0	20.97	.16	6	89.0	59.76	81.9	79.8	118.32	.98	1
119	10.0	7.9	20.97	.16	6	89.0	60.25	81.9	79.9	119.32	.98	1
120	9.9	7.9	20.97	.15	6	89.1	60.75	82.0	80.0	120.31	.98	1
121	9.8	7.8	20.98	.15	6	89.1	61.24	82.1	80.0	121.31	.99	1
122	9.7	7.8	20.98	.15	6	89.1	61.73	82.1	80.1	122.31	.99	1
123	9.7	7.7	20.98	.15	6	89.1	62.23	82.2	80.2	123.31	.99	1
124	9.6	7.6	20.98	.15	6	89.1	62.72	82.2	80.3	124.30	.99	1
125	9.5	7.6	20.98	.15	6	89.1	63.22	82.3	80.3	125.30	.99	1
126	9.4	7.5	20.98	.15	6	89.1	63.71	82.4	80.4	126.30	.99	1
127	9.3	7.5	20.98	.15	6	89.1	64.21	82.4	80.5	127.30	.99	1
128	9.2	7.4	20.98	.14	6	89.1	64.70	82.5	80.6	128.29	.99	1
129	9.2	7.3	20.98	.14	6	89.1	65.20	82.5	80.7	129.29	.99	1
130	9.1	7.3	20.98	.14	6	89.1	65.69	82.6	80.7	130.29	.99	1
131	9.1	7.2	20.98	.14	6	89.1	66.18	82.6	80.8	131.29	.99	1
132	9.0	7.2	20.98	.14	6	89.1	66.68	82.7	80.9	132.29	.99	1

20 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
20	49.0	40.4	21.41	.70	4	85.9	14.14					
21	47.5	39.1	21.45	.69	4	86.0	14.50	50.3	41.9	22.38	.72	4
22	46.1	37.9	21.48	.67	4	86.1	14.87	51.5	43.3	23.34	.74	4
23	44.7	36.7	21.51	.65	4	86.2	15.24	52.7	44.7	24.31	.75	3
24	43.5	35.6	21.54	.64	5	86.3	15.62	53.8	46.0	25.28	.77	3
25	42.2	34.6	21.56	.62	5	86.4	16.01	54.9	47.2	26.25	.78	3
26	41.0	33.6	21.59	.61	5	86.5	16.40	55.9	48.4	27.22	.79	3
27	39.9	32.6	21.61	.59	5	86.6	16.80	56.8	49.6	28.19	.80	3
28	38.9	31.7	21.63	.58	5	86.7	17.20	57.8	50.7	29.16	.81	3
29	37.8	30.9	21.65	.57	5	86.7	17.61	58.6	51.7	30.14	.82	3
30	36.9	30.1	21.67	.55	5	86.8	18.03	59.4	52.7	31.11	.83	3
31	35.9	29.3	21.68	.54	5	86.9	18.45	60.2	53.6	32.08	.84	2
32	35.0	28.5	21.70	.53	5	87.0	18.87	61.0	54.5	33.06	.85	2
33	34.2	27.8	21.71	.52	5	87.0	19.29	61.7	55.4	34.04	.85	2
34	33.3	27.1	21.73	.50	5	87.1	19.72	62.4	56.2	35.01	.86	2
35	32.6	26.5	21.74	.49	5	87.2	20.15	63.0	57.0	35.99	.87	2
36	31.8	25.9	21.75	.48	5	87.2	20.59	63.7	57.8	36.97	.87	2
37	31.1	25.3	21.76	.47	5	87.3	21.03	64.3	58.5	37.95	.88	2
38	30.4	24.7	21.77	.46	5	87.3	21.47	64.9	59.2	38.93	.88	2
39	29.8	24.2	21.78	.45	5	87.4	21.91	65.4	59.9	39.91	.89	2
40	29.1	23.6	21.79	.45	5	87.4	22.36	65.9	60.5	40.90	.89	2
41	28.5	23.1	21.80	.44	5	87.5	22.81	66.5	61.1	41.88	.90	2
42	27.9	22.6	21.81	.43	5	87.5	23.26	67.0	61.7	42.86	.90	2
43	27.4	22.2	21.81	.42	5	87.6	23.72	67.4	62.3	43.84	.90	2
44	26.8	21.7	21.82	.41	5	87.6	24.17	67.9	62.9	44.83	.91	2
45	26.3	21.3	21.83	.40	5	87.7	24.62	68.3	63.4	45.81	.91	2
46	25.8	20.9	21.84	.40	5	87.7	25.08	68.8	63.9	46.80	.92	2
47	25.3	20.5	21.84	.39	5	87.8	25.54	69.2	64.4	47.78	.92	2
48	24.8	20.1	21.85	.38	5	87.8	26.00	69.6	64.9	48.77	.92	2
49	24.4	19.7	21.85	.38	5	87.8	26.46	70.0	65.3	49.76	.92	2

20 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
50	23.9	19.4	21.86	.37	5	87.9	26.93	70.3	65.8	50.74	.93	1
51	23.5	19.0	21.86	.36	5	87.9	27.39	70.7	66.2	51.73	.93	1
52	23.1	18.7	21.87	.36	5	87.9	27.86	71.0	66 6	52 72	.93	1
53	22.7	18.3	21 87	.35	5	88.0	28 32	71.4	670	53.71	93	1
54	22.3	18.0	21.88	.34	5	88.0	28.79	71.7	67.4	54.69	.94	1
55	219	17.7	21.88	.34	5	88.0	29.26	72.0	67.8	55 68	94	1
56	21.6	17.4	21.88	.33	5	88.1	29.73	72 3	68.1	56 67	94	1
57	21.2	17.1	21.89	.33	5	88.1	30.20	72.6	68.5	57 66	.94	1
58	20.9	16.8	21.89	.32	5	88.1	30.68	72.9	68.8	58 65	.94	1
59	20.6	16.6	21.89	32	5	88.2	31.15	73.1	69.2	59.64	94	1
60	20.2	16.3	21.90	.31	5	88.2	31.62	73 4	69.5	60.63	.95	1
61	19.9	16.1	21.90	.31	5	88.2	32.10	73.7	69.8	61.62	.95	1
62	19.6	15.8	21.90	.30	5	88.2	32.57	73.9	70.1	62.61	.95	1
63	19.3	15.6	21.91	.30	5	88.3	33.05	74.1	70.4	63 60	.95	1
64	19.0	15.4	21.91	.30	5	88.3	33.53	74.4	70.7	64.60	.95	1
65	18.8	15.1	21.91	.29	5	88.3	34.00	74.6	71.0	65.59	.95	1
66	18.5	14.9	21.91	.29	5	88.3	34.48	74.8	71.3	66.58	.95	1
67	18.2	14.7	21.92	.28	5	88.4	34.96	75.0	71.5	67.57	.96	1
68	18.0	14.5	21.92	.28	6	88.4	35.44	75.2	71.8	68.56	.96	1
69	17.7	14.3	21.92	.28	6	88.4	35.92	75.4	72.0	69.56	.96	1
70	17.4	14.1	21.92	.27	6	88.4	36.40	75.6	72.3	70.55	.96	1
71	17.2	13.9	21.92	.27	6	88.4	36.88	75.8	72.6	71.54	.96	1
72	17.0	13.7	21.93	.26	6	88.5	37.36	76.0	72.8	72.53	.96	1
73	16.8	13.6	21.93	.26	6	88.5	37.84	76.2	73.0	73.53	.96	1
74	16.5	13.4	21.93	.26	6	88.5	38.33	76.4	73.2	74.52	.96	1
75	16.3	13.2	21.93	.26	6	88.5	38.81	76.6	73.4	75.52	.96	1
76	16.1	13.0	21.93	.25	6	88.5	39.29	76.7	73.6	76.51	.96	1
77	15.9	12.9	21.94	.25	6	88.6	39.78	76.9	73.9	77.50	.97	1
78	15.7	12.7	21.94	.25	6	88.6	40.26	77.1	74.0	78.50	.97	1
79	15.5	12.6	21.94	.24	6	88.6	40.75	77.2	74.3	79.49	.97	1

	PINION					PINION AND GEAR		GEAR				
20 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
80	15.3	12.4	21.94	.24	G	88.6	41.23	77.4	74.4	80.48	.97	1
81	15.2	12.3	21.94	.24	G	88.6	41.72	77.5	74.6	81.48	.97	1
82	15.0	12.2	21.94	.23	G	88.6	42.20	77.7	74.8	82.47	.97	1
83	14.8	12.0	21.94	.23	G	88.7	42.69	77.8	75.0	83.47	.97	1
84	14.7	11.9	21.95	.23	G	88.7	43.17	77.9	75.1	84.46	.97	1
85	14.5	11.7	21.95	.23	G	88.7	43.66	78.1	75.3	85.46	.97	1
86	14.3	11.6	21.95	.22	G	88.7	44.15	78.2	75.5	86.45	.97	1
87	14.2	11.5	21.95	.22	G	88.7	44.63	78.4	75.6	87.45	.97	1
88	14.0	11.4	21.95	.22	G	88.7	45.12	78.5	75.8	88.44	.97	1
89	13.8	11.2	21.95	.22	G	88.7	45.61	78.6	76.0	89.44	.97	1
90	13.7	11.1	21.95	.22	G	88.8	46.10	78.7	76.1	90.44	.97	1
91	13.6	11.0	21.95	.21	G	88.8	46.59	78.9	76.3	91.43	.97	1
92	13.4	10.9	21.95	.21	G	88.8	47.07	79.0	76.4	92.43	.97	1
93	13.2	10.7	21.95	.21	G	88.8	47.56	79.1	76.5	93.42	.97	1.
94	13.1	10.6	21.96	.21	G	88.8	48.05	79.2	76.7	94.42	.98	1
95	13.0	10.5	21.96	.20	G	88.8	48.54	79.3	76.9	95.41	.98	1
96	12.9	10.4	21.96	.20	G	88.8	49.03	79.4	77.0	96.41	.98	1
97	12.7	10.3	21.96	.20	G	88.8	49.52	79.5	77.1	97.41	.98	1
98	12.6	10.2	21.96	.20	G	88.8	50.01	79.6	77.2	98.40	.98	1
99	12.5	10.1	21.96	.20	G	88.9	50.50	79.7	77.3	99.40	.98	1
100	12.4	10.0	21.96	.19	G	88.9	50.99	79.8	77.5	100.39	.98	1
101	12.3	9.9	21.96	.19	G	88.9	51.48	79.9	77.6	101.39	.98	1
102	12.1	9.8	21.96	.19	G	88.9	51.97	80.0	77.7	102.39	.98	1
103	12.0	9.7	21.96	.19	G	88.9	52.46	80.1	77.8	103.38	.98	1
104	11.9	9.6	21.96	.19	G	88.9	52.95	80.2	77.9	104.38	.98	1
105	11.8	9.5	21.96	.19	G	88.9	53.44	80.3	78.0	105.38	.98	1
106	11.7	9.4	21.96	.18	G	88.9	53.93	80.4	78.1	106.37	.98	1
107	11.6	9.4	21.97	.18	G	88.9	54.43	80.5	78.2	107.37	.98	1
108	11.5	9.3	21.97	.18	G	89.0	54.92	80.6	78.3	108.36	.98	1
109	11.4	9.2	21.97	.18	G	89.0	55.41	80.7	78.5	109.36	.98	1

	PINION					PINION AND GEAR		GEAR				
20 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
110	11.3	9.1	21.97	.18	G	89.0	55.90	80.7	78.6	110.36	.98	1
111	11.2	9.0	21.97	.18	G	89.0	56.39	80.8	78.7	111.36	.98	1
112	11.1	8.9	21.97	.17	G	89.0	56.88	80.9	78.8	112.35	.98	1
113	11.0	8.9	21.97	.17	G	89.0	57.38	81.0	78.9	113.35	.98	1
114	10.9	8.8	21.97	.17	G	89.0	57.87	81.1	79.0	114.35	.98	1
115	10.8	8.7	21.97	.17	G	89.0	58.36	81.2	79.0	115.34	.98	1
116	10.7	8.6	21.97	.17	G	89.0	58.86	81.2	79.1	116.34	.98	1
117	10.6	8.6	21.97	.17	G	89.0	59.35	81.3	79.2	117.34	.98	1
118	10.5	8.5	21.97	.17	G	89.0	59.84	81.4	79.3	118.34	.98	1
119	10.4	8.4	21.97	.16	G	89.0	60.33	81.5	79.4	119.33	.98	1
120	10.3	8.4	21.97	.16	G	89.1	60.83	81.5	79.5	120.33	.98	1
121	10.3	8.3	21.97	.16	G	89.1	61.32	81.6	79.6	121.33	.98	1
122	10.2	8.2	21.97	.16	G	89.1	61.81	81.6	79.6	122.32	.98	1
123	10.1	8.2	21.97	.16	G	89.1	62.31	81.7	79.7	123.32	.98	1
124	10.0	8.1	21.97	.16	G	89.1	62.80	81.8	79.8	124.32	.98	1
125	10.0	8.0	21.97	.16	G	89.1	63.29	81.8	79.9	125.32	.98	1
126	9.9	8.0	21.97	.15	G	89.1	63.79	81.9	80.0	126.31	.98	1
127	9.8	7.9	21.97	.15	G	89.1	64.28	82.0	80.0	127.31	.98	1
128	9.7	7.8	21.98	.15	G	89.1	64.78	82.0	80.1	128.31	.99	1
129	9.6	7.8	21.98	.15	G	89.1	65.26	82.1	80.2	129.31	.99	1
130	9.6	7.7	21.98	.15	G	89.1	65.76	82.2	80.3	130.30	.99	1
131	9.5	7.7	21.98	.15	G	89.1	66.26	82.2	80.4	131.30	.99	1
132	9.4	7.6	21.98	.15	G	89.1	66.75	82.3	80.5	132.30	.99	1

	PINION					PINION AND GEAR		GEAR				
21 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
21	48.8	40.6	22.41	.70	4	86.1	14.85					
22	47.4	39.4	22.45	.69	4	86.2	15.21	50.0	42.1	23.38	.72	4
23	46.0	38.2	22.48	.67	4	86.3	15.57	51.2	43.4	24.35	.74	4
24	44.7	37.0	22.51	.66	4	86.4	15.94	52.3	44.7	25.32	.75	3
25	43.5	36.0	22.53	.64	4	86.5	16.32	53.4	46.0	26.29	.76	3
26	42.3	35.0	22.55	.63	4	86.6	16.71	54.5	47.2	27.26	.77	3
27	41.2	34.0	22.58	.61	4	86.6	17.10	55.4	48.3	28.23	.79	3
28	40.1	33.1	22.60	.60	4	86.7	17.50	56.3	49.4	29.20	.80	3
29	39.1	32.2	22.62	.58	5	86.8	17.90	57.2	50.5	30.17	.81	3
30	38.1	31.4	22.64	.57	5	86.9	18.31	58.0	51.4	31.15	.82	3
31	37.1	30.6	22.66	.56	5	86.9	18.72	58.9	52.4	32.12	.83	2
32	36.2	29.8	22.67	.55	5	87.0	19.14	59.6	53.3	33.10	.83	2
33	35.3	29.1	22.69	.53	5	87.1	19.56	60.4	54.2	34.07	.84	2
34	34.5	28.4	22.70	.52	5	87.1	19.98	61.1	55.0	35.05	.85	2
35	33.7	27.8	22.72	.51	5	87.2	20.41	61.8	55.9	36.03	.86	2
36	33.0	27.1	22.73	.50	5	87.2	20.84	62.4	56.6	37.01	.86	2
37	32.3	26.5	22.74	.49	5	87.3	21.27	63.0	57.4	37.99	.87	2
38	31.6	25.9	22.75	.48	5	87.4	21.71	63.7	58.1	38.97	.87	2
39	30.9	25.4	22.76	.47	5	87.4	22.15	64.2	58.8	39.95	.88	2
40	30.2	24.8	22.77	.46	5	87.5	22.59	64.8	59.4	40.93	.88	2
41	29.6	24.3	22.78	.45	5	87.5	23.03	65.3	60.0	41.91	.89	2
42	29.0	23.8	22.79	.45	5	87.6	23.48	65.8	60.7	42.90	.89	2
43	28.4	23.3	22.80	.44	5	87.6	23.93	66.3	61.3	43.88	.90	2
44	27.8	22.8	22.80	.43	5	87.6	24.38	66.8	61.8	44.86	.90	2
45	27.3	22.4	22.81	.42	5	87.7	24.83	67.3	62.4	45.85	.90	2
46	26.8	21.9	22.82	.41	5	87.7	25.28	67.7	62.9	46.83	.91	2
47	26.3	21.5	22.83	.41	5	87.8	25.74	68.1	63.4	47.82	.91	2
48	25.8	21.1	22.83	.40	5	87.8	26.20	68.5	63.9	48.80	.91	2
49	25.3	20.7	22.84	.39	5	87.8	26.65	68.9	64.4	49.79	.92	2
50	24.9	20.4	22.84	.39	5	87.9	27.12	69.3	64.8	50.78	.92	2

21 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
51	24.4	20.0	22.85	.38	5	87.9	27.58	69.7	65.3	51.76	.92	1
52	24.0	19.6	22.85	.37	5	87.9	28.04	70.0	65.7	52 75	.92	1
53	23.6	19.3	22.86	.37	5	88.0	28.50	70.4	66.1	53.74	.93	1
54	23.2	19.0	22.86	.36	5	88.0	28.97	70.7	66.5	54.72	.93	1
55	22.8	18.6	22.87	.35	5	88.0	29.44	71.0	66.9	55.71	.93	1
56	22.4	18.3	22.87	.35	5	88.1	29.90	71.3	67.3	56.70	.93	1
57	22.1	18.0	22.88	.34	5	88.1	30.37	71.6	67.6	57.69	.94	1
58	21.8	17.7	22.88	.34	5	88.1	30.84	71.9	68.0	58.68	.94	1
59	21.4	17.5	22.88	.33	5	88.2	31.31	72.2	68.3	59 67	.94	1
60	21.1	17.3	22.89	.33	5	88.2	31.78	72.5	68.6	60 66	.94	1
61	20.7	16:9	22.89	.32	5	88.2	32.26	728	68.9	61 65	.94	1
62	20.4	16.7	22.89	.32	5	88.2	32.73	73.0	69.3	62.64	.94	1
63	20.1	16.4	22.90	.31	5	88.3	33.20	73.3	69.6	63 63	.94	1
64	19.8	16.2	22.90	.31	5	88.3	33.68	73.5	69.9	64.62	.95	1
65	19.5	16.0	22.90	.30	5	88.3	34.15	73.8	70.2	65.61	.95	1
66	19.3	15.7	22.91	.30	5	88.3	34.63	74.0	70.5	66.61	.95	1
67	19.0	15.5	22.91	.30	5	88.4	35.11	742	70.8	67 60	.95	1
68	18.7	15.3	22.91	.29	5	88.4	35.58	74.4	71.0	68.59	.95	1
69	18.5	15.1	22.91	.29	5	88.4	86.06	74.7	71.3	69.58	.95	1
70	18.1	14.9	22.92	.28	5	88.4	36.54	74.9	71.6	70.57	.96	1
71	17.9	14.7	22.92	.28	5	88.4	37.02	75.1	71.8	71.57	.96	1
72	17.7	14.5	22.92	.28	5	88.5	37.50	75.3	72.1	72.56	.96	1
73	17.5	14.3	22.92	.27	5	88.5	37.98	75.5	72.3	73.55	.96	1
74	17.2	14.1	22.92	.27	5	88.5	38.46	75.7	72.5	74.54	.96	1
75	17.0	13.9	22.93	.27	5	88.5	38.94	75.9	72.7	75.54	.96	1
76	16.8	13.7	22.93	.26	5	88.5	39.42	76.0	73.0	76.53	.96	1
77	16.6	13.6	22.93	.26	5	88.6	39.91	76.2	73.2	77.53	.96	1
78	16.4	13.4	22.93	.26	5	88.6	40.39	76.4	73.4	78.52	.96	1
79	16.2	13.2	22.93	.25	5	88.6	40.87	76.6	73.6	79 51	.96	1
80	16.0	13.1	22.93	.25	5	88.6	41.35	76.7	73.8	80.51	.96	1

	PINION					PINION AND GEAR		GEAR				
21 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
81	15.8	12.9	22.94	.25	5	88.6	41.84	76.9	74.0	81.50	.97	1
82	15.6	12.8	22.94	.25	5	88.6	42.32	77.0	74.2	82.50	.97	1
83	15.4	12.6	22.94	.24	5	88.7	42.81	77.2	74.3	83.49	.97	1
84	15.3	12.5	22.94	.24	5	88.7	43.29	77.3	74.5	84.48	.97	1
85	15.1	12.3	22.94	.24	5	88.7	43.78	77.5	74.7	85.48	.97	1
86	14.9	12.2	22.94	.23	5	88.7	44.26	77.6	74.9	86.47	.97	1
87	14.8	12.0	22.94	.23	5	88.7	44.75	77.8	75.0	87.47	.97	1
88	14.6	11.9	22.94	.23	5	88.7	45.24	77.9	75.2	88.47	.97	1
89	14.4	11.8	22.95	.23	5	88.7	45.72	78.0	75.4	89.46	.97	1
90	14.3	11.7	22.95	.23	5	88.8	46.21	78.1	75.5	90.46	.97	1
91	14.1	11.5	22.95	.22	5	88.8	46.70	78.3	75.7	91.45	.97	1
92	14.0	11.4	22.95	.22	5	88.8	47.18	78.4	75.8	92.45	.97	1
93	13.8	11.3	22.95	.22	5	88.8	47.67	78.5	76.0	93.44	.97	1
94	13.7	11.2	22.95	.22	5	88.8	48.16	78.6	76.1	94.44	.97	1
95	13.6	11.1	22.95	.21	5	88.8	48.65	78.7	76.3	95.43	.97	1
96	13.4	11.0	22.95	.21	5	88.8	49.14	78.9	76.4	96.43	.97	1
97	13.3	10.9	22.95	.21	5	88.8	49.62	79.0	76.5	97.42	.97	1
98	13.2	10.7	22.96	.21	5	88.9	50.11	79.1	76.7	98.42	.98	1
99	13.0	10.6	22.96	.21	5	88.9	50.60	79.2	76.8	99.42	.98	1
100	12.9	10.5	22.96	.20	5	88.9	51.09	79.3	76.9	100.41	.98	1
101	12.8	10.4	22.96	.20	5	88.9	51.58	79.4	77.0	101.41	.98	1
102	12.7	10.3	22.96	.20	5	88.9	52.07	79.5	77.2	102.40	.98	1
103	12.5	10.2	22.96	.20	5	88.9	52.56	79.6	77.3	103.40	.98	1
104	12.4	10.1	22.96	.20	5	88.9	53.05	79.7	77.4	104.40	.98	1
105	12.3	10.0	22.96	.19	5	88.9	53.54	79.8	77.5	105.39	.98	1
106	12.2	10.0	22.96	.19	5	88.9	54.03	79.9	77.6	106.39	.98	1
107	12.1	9.9	22.96	.19	5	88.9	54.52	80.0	77.7	107.39	.98	1
108	12.0	9.8	22.96	.19	5	89.0	55.01	80.1	77.8	108.38	.98	1
109	11.9	9.7	22.96	.19	5	89.0	55.50	80.2	78.0	109.38	.98	1
110	11.8	9.6	22.96	.19	5	89.0	55.99	80.2	78.1	110.38	.98	1

21 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
111	11.7	9.5	22.96	.18	5	89.0	56.48	80.3	78.2	111.37	.98	1
112	11.6	9.4	22.97	.18	5	89.0	56.97	80.4	78.3	112.37	.98	1
113	11.5	9.3	22.97	.18	5	89.0	57.47	80.5	78.4	113.37	.98	1
114	11 4	9.3	22.97	.18	5	89.0	57.96	80.6	78.5	114.36	.98	1
115	11.3	9.2	22.97	.18	5	89.0	58.45	80.7	78.6	115.36	.98	1
116	11.2	9.1	22.97	.18	5	89.0	58.94	80.8	78.7	116.36	.98	1
117	11.1	9.0	22.97	.17	5	89.0	59.43	80.8	78.8	117.35	.98	1
118	11.0	9.0	22.97	.17	5	89.0	5993	80.9	78.9	118.35	.98	1
119	10.9	8.9	22.97	.17	5	89.0	60.42	81.0	79.0	119.35	.98	1
120	10.8	8.8	22.97	.17	5	89.1	60.91	81.1	79.1	120.35	.98	1
121	10.7	8.7	22.97	.17	5	89.1	61.40	81.1	79.1	121.34	.98	1
122	10.6	8.7	22.97	.17	5	89.1	61.90	81.2	79.2	122.34	.98	1
123	10.6	8.6	22.97	17	5	89.1	62.39	81.3	79.3	123 34	.98	1
124	10.5	8.5	22.97	.17	5	89.1	62.88	81.3	79.4	124.34	.98	1
125	10.4	8.5	22.97	.16	5	89.1	63.37	81.4	79.5	125.33	.98	1
126	10 3	8.4	22.97	.16	5	89.1	63.87	81.5	79.6	126.33	98	1
127	10.2	8.3	22.97	.16	5	89.1	64.36	81.5	79.6	127.33	.98	1
128	10.1	8 3	22.97	.16	5	89.1	6486	81.6	79.7	128.33	.98	1
129	10 1	8.2	22.97	.16	5	89.1	65.35	81.7	79.8	129.32	.98	1
130	10 0	8.1	22.97	.16	5	89.1	65.84	81.7	79.9	130.32	.98	1
131	9.9	8.1	22.97	.16	5	89.1	66.34	81.8	80.0	131.32	.98	1
132	9.8	8.0	22.97	.16	5	89.1	66.83	81.9	80.0	132.32	.98	1

22 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
22	48.7	40.8	23.41	.70	4	86.3	15.56					
23	47.2	39.6	23.45	.69	4	86.4	15.91	49.8	42.2	24.38		4
24	46.0	38.5	23.48	.67	4	86.5	16.28	51.0	43.5	25.35	.72	3
25	44.7	37.4	23.50	.66	4	86.6	16.65	52.0	44.8	26.32	.74	3
20	43.5	36.4	23.53	.64	4	86.6	17.03	53.1	46.0	27.29	.75	3
27	42.4	35.4	23.55	.63	4	86.7	17.41	54.1	47.1	28.26	.76	3
28	41.3	34.5	23.57	.61	4	86.8	17.80	55.0	48.2	29.23	.77	3
29	40.2	33.6	23.59	.60	4	86.8	18.20	55.9	49.2	30.21	.78	3
30	39.2	32.7	23.61	.59	4	86.9	18.60	56.8	50.2	31.18	.79	3
31	38.3	31.9	23.63	.58	4	87.0	19.01	57.6	51.2	32.16	.80	3
32	37.4	31.1	23.65	.56	4	87.0	19.42	58.4	52.1	33.13	.81	2
33	36.5	30.4	23.67	.55	4	87.1	19.83	59.2	53.0	34.11	.82	2
34	35.7	29.6	23.68	.54	4	87.2	20.25	59.9	53.9	35.09	.83	2
35	34.9	29.0	23.69	.53	4	87.2	20.67	60.5	54.7	36.07	.84	2
36	34.1	28.3	23.71	.52	5	87.3	21.09	61.2	55.5	37.04	.84	2
37	33.3	27.7	23.72	.51	5	87.3	21.52	61.9	56.3	38.02	.85	2
38	32.6	27.1	23.73	.50	5	87.4	21.95	61.5	57.0	39.00	.86	2
39	31.9	26.5	23.74	.49	5	87.4	22.39	63.1	57.7	39.98	.87	2
40	31.3	26.0	23.75	.48	5	87.5	22.83	63.6	58.3	40.96	.87	2
41	30.6	25.4	23.76	.47	5	87.5	23.26	64.2	59.0	41.95	.88	2
42	30.0	24.9	23.77	.46	5	87.6	23.71	64.7	59.6	42.93	.88	2
43	29.4	24.4	23.78	.45	5	87.6	24.15	65.2	60.2	43.91	.89	2
44	28.8	23.9	23.79	.45	5	87.7	24.60	65.7	60.8	44.90	.89	2
45	28.4	23.5	23.80	.44	5	87.7	25.04	66.2	61.4	45.88	.90	2
46	27.7	23.0	23.80	.43	5	87.7	25.50	66.7	61.9	46.86	.90	2
47	27.2	22.6	23.81	.42	5	87.8	25.95	67.1	62.4	47.85	.90	2
48	26.7	22.2	23.82	.41	5	87.8	26.40	67.5	63.0	48.83	.91	2
49	26.3	21.8	23.83	.41	5	87.9	26.86	67.9	63.4	49.82	.91	2
50	25.8	21.4	23.83	.40	5	87.9	27.31	68.3	63.8	50.81	.91	2
51	25.4	21.0	23.84	.39	5	87.9	27.77	68.7	64.3	51.79	.92	2

22 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
52	24.9	20.6	23.84	.39	5	88 0	28.23	69.0	64.8	52.78	.92	1
53	24.5	20.3	23 85	.38	5	88.0	28.69	69.4	65.2	53.77	.92	1
54	24.1	19.9	23.85	.38	5	88.0	29.15	69.8	65.6	54.76	92	1
55	23.7	19.6	23.86	.37	5	88.1	29.62	70.1	66.0	55.74	.93	1
56	23.3	19.3	23.86	36	5	88.1	30.08	70.4	66.4	56.73	.93	1
57	23.0	19.0	23.87	.36	5	88.1	30.55	70.8	66.7	57.72	93	1
58	22.6	18.7	23.87	.35	5	88.1	31.02	71.1	67.1	58.71	.93	1
59	22.2	18.4	23.87	.35	5	88.2	31.48	71.4	67.4	59.70	93	1
60	21.9	18.1	23.88	.34	5	88.2	31.95	71.6	67.8	60.69	.94	1
61	21.6	17.8	23.88	.34	5	88.2	32.42	71.9	68.1	61.68	.94	1
62	21.3	17.5	23.88	.33	5	88.3	32.89	72.2	68.5	62.67	.94	1
63	20.9	17.3	23.89	.33	5	88.3	33.37	72.5	68.8	63.66	.94	1
64	20.6	17.0	23.89	.32	5	88.3	33.84	72.7	69.1	64.65	.94	1
65	20.3	16.8	23.89	.32	5	88.3	34.31	73.0	69.4	65.64	.94	1
66	20.1	16.6	23.90	.31	5	88.3	34.78	73.2	69.7	66.63	.95	1
67	19.8	16.3	23.90	.31	5	88.4	35.26	73.5	70.0	67.62	.95	1
68	19.5	16.1	23.90	.30	5	88.4	35.73	73.7	70.2	68.61	.95	1
69	19.2	15.9	23.91	.30	5	88.4	36.21	73.9	70.5	69.61	.95	1
70	18.9	15.7	23:91	.30	5	884	36.69	74.1	70.8	70.60	.95	1
71	18.7	15.5	23.91	.29	5	88.5	37.17	74.3	71.0	71.59	.95	1
72	18.5	15.3	23.91	.29	5	88.5	37.64	74.5	71.3	72.58	.95	1
73	18.2	15.1	23.91	.29	5	88.5	38.12	74.7	71.5	73.58	.95	1
74	18.0	14.9	23.92	28	5	88.5	38.60	74.9	71.8	74.57	.96	1
75	17.8	14.7	23.92	.28	5	88.5	39.08	75.1	72.0	75.56	.96	1
76	17.5	14.5	23.92	.28	5	88.5	39.56	75.3	72.2	76.56	.96	1
77	17.3	14.3	23.92	27	5	88.6	40.04	75.5	72.5	77.55	.96	1
78	17.1	14.1	23.92	.27	5	88.6	40.52	75.7	72.7	78.54	.96	1
79	16.9	14.0	23.93	.27	5	88.6	41.00	75.8	72.9	79.54	.96	1
80	16.7	13.8	23.93	.26	5	88.6	41.48	76.0	73.1	80.53	.96	1
81	16.5	13.6	23.93	.26	5	88.6	41.97	76.2	73.3	81.52	.96	1

22 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
82	16.3	13.5	23.93	.26	5	88.6	42.95	76.4	73.5	82.52	.96	1
83	16.1	13.3	23.93	.25	5	88.7	42 93	76.5	73.7	83.51	.96	1
84	16.0	13.2	23.93	.25	5	88.7	43.42	76.7	73.9	84.51	.96	1
85	15 8	13 0	23.94	.25	5	88.7	43.90	76.8	74 0	85.50	.97	1
86	15.6	12 9	23.94	.25	5	88.7	44.38	76.9	74.2	86.50	.97	1
87	15.4	12 7	23.94	.24	5	88.7	44.87	77.1	74.4	87.49	.97	1
88	15.2	12 6	23.94	.24	5	88.7	45.35	77.2	74.6	88.49	.97	1
89	15.1	12.4	23.94	.24	5	88.7	45.84	77.4	74.7	89.48	.97	1
90	14.9	12 3	23.94	.24	5	88.8	46.32	77.5	74.9	90.48	.97	1
91	14.8	12 2	23.94	.23	5	88.8	46.81	77.7	75.0	91.47	.97	1
92	14.6	12 1	23.94	.23	5	88.8	47.30	77.8	75.2	92.47	.97	1
93	14 5	12 0	23.95	.23	5	88.8	47.78	77.9	75.3	93.46	.97	1
94	14 3	11.8	23.95	.23	5	88.8	48.27	78.0	75.5	94.46	.97	1
95	14 2	11.7	23.95	.22	5	88.8	48.76	78.2	75.7	95.45	.97	1
96	14 0	11.6	23.95	.22	5	88.8	49.24	78.3	75.8	96.45	.97	1
97	13.9	11.5	23.95	.22	5	88.8	49.73	78.4	75.9	97.44	.97	1
98	13.7	11.3	23.95	.22	5	88.9	50.22	78.5	76.1	98.44	.97	1
99	13.6	11.2	23.95	.21	5	88.9	50.71	78.6	76.2	99.43	.97	1
100	13.5	11.1	23.95	.21	5	88.9	51.19	78.7	76.3	100.43	.97	1
101	13 4	11.0	23.95	.21	5	88.9	51.68	78.8	76.5	101.43	.97	1
102	13.2	10.9	23.95	.21	5	88.9	52.17	78.9	76.6	102.42	.97	1
103	13.1	10.8	23.96	.21	5	88.9	52.66	79.0	76.7	103.42	.98	1
104	13.0	10.7	23.96	.21	5	88.9	53.15	79.1	76.9	104.42	.98	1
105	12.9	10.6	23.96	.20	5	88.9	53.64	79.3	77.0	105.41	.98	1
106	12.7	10.5	23.96	.20	5	88.9	54.13	79.4	77.1	106.41	.98	1
107	12.6	10.4	23.96	.20	5	88.9	54.62	79.5	77.2	107.40	.98	1
108	12.5	10.3	23.96	.20	5	89.0	55.11	79.5	77.3	108.40	.98	1
109	12.4	10.2	23.96	.20	5	89.0	55.60	79.6	77.4	109.40	.98	1
110	12.3	10.1	23.96	.20	5	89.0	56.09	79.7	77.5	110.39	.98	1
111	12.2	10.0	23.96	.19	5	89.0	56.58	79.8	77.6	111.39	.98	1

	PINION					PINION AND GEAR		GEAR				
22 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
112	12 1	10.0	23 96	.19	5	890	5707	79.9	77.8	112 39	.98	1
113	12.0	9.9	23.96	19	5	890	5756	80.0	77 9	113.38	.98	1
114	11.9	9.8	23.96	.19	5	890	58.05	80.1	78 0	114 38	.98	1
115	11.8	9.7	23.96	.19	5	890	5859	80.2	78.1	115.38	.98	1
116	11.7	9.6	23.96	.18	5	890	59.03	80.3	78.2	116.37	.98	1
117	11 5	9.5	23.96	18	5	890	59.57	80.3	78 3	117 37	.98	1
118	11.4	9 5	23.97	.18	5	890	60.02	80.4	78 4	118.37	.98	1
119	11.3	9.4	23.97	.18	5	89.0	60 51	80.5	78 5	119.36	.98	1
120	11.3	9.3	23.97	.18	5	89.1	61.00	80.6	78 6	120.36	98	1
121	11.2	9.2	23.97	.18	5	89 1	61.49	80.6	78.7	121 36	.98	1
122	11.1	9.1	23.97	.18	5	89.1	61 98	80.7	78 7	122.36	.98	1
123	11.0	9.1	23.97	.17	5	89.1	62 48	80 8	78 8	123 35	.98	1
124	10.9	9.0	23.97	.17	5	89.1	62 97	80.9	78 9	124.35	.98	1
125	10.8	8.9	23.97	.17	5	89.1	63 46	80.9	79 0	125.35	.98	1
126	10 8	8.9	23 97	.17	5	89.1	63 95	81 0	79 1	126.35	.98	1
127	10 7	8.8	23.97	.17	5	89.1	64.44	81 1	79 2	127.34	.98	1
128	10.6	8.7	23 97	.17	5	89 1	64.94	81.2	79 3	128.34	.98	1
129	10.5	8.6	23.97	17	5	89.1	65.43	81.2	79 3	129.34	.98	1
130	10.4	8 6	23.97	17	5	89.1	65 92	81.3	79.4	130.34	.98	1
131	10.4	8.5	23.97	.16	5	89.1	66.42	81.4	79.5	131.33	.98	1
132	10.3	8.5	23 97	.16	5	89.1	66 91	81 4	79 6	132.33	.98	1

	PINION					PINION AND GEAR		GEAR				
23 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
23	48.5	41.0	2441	.70	4	86.5	16.26					
24	47.1	39.8	24.44	.69	4	86.5	16.62	49.6	42.3	25.38	.72	3
25	45.9	38.7	24.47	.67	4	86.6	16.99	50.7	43.5	26.35	.73	3
26	44.7	37.7	24.50	.66	4	86.7	17.36	51.8	44.7	27.32	.75	3
27	43.6	36.7	24.52	.64	4	86.8	17.73	52.8	45.9	28.29	.76	3
28	42.5	35.8	24.55	.63	4	86.8	18.12	53.7	47.0	29.27	.77	3
29	41.5	34.9	24.57	.62	4	87.9	18.51	54.6	48.0	30.24	.78	3
30	40.5	34.0	24.59	.60	4	87.0	18.90	55.5	49.1	31.21	.79	3
31	39.5	33.2	24.61	.59	4	87.0	19.30	56.4	50.0	32.19	.80	3
32	38.6	32.4	24.63	.58	4	87.1	19.70	57.2	51.0	33.17	.81	2
33	37.7	31.6	24.64	.57	4	87.1	20.11	57.9	51.9	34.14	.82	2
34	36.8	30.9	24.66	.56	4	87.2	20.52	58.7	52.8	35.12	.83	2
35	36.0	30.2	24.67	.55	4	87.3	20.94	59.4	53.6	36.10	.83	2
36	35.2	29.5	24.69	.54	4	87.3	21.36	60.1	54.4	37.08	.84	2
37	34.5	28.8	24.70	.53	4	87.4	21.78	60.8	55.1	38.06	.85	2
38	33.7	28.2	24.71	.52	4	87.4	22.21	61.4	55.9	39.04	.85	2
39	33.0	27.6	24.72	.51	4	87.5	22.64	62.0	56.6	40.02	.86	2
40	32.3	27.1	24.73	.50	4	87.5	23.07	62.6	57.3	41.00	.86	2
41	31.7	26.5	24.75	.49	4	87.6	23.50	63.1	57.9	41.98	.87	2
42	31.1	26.0	24.75	.47	4	87.6	23.94	63.7	58.5	42.96	.87	2
43	30.5	25.4	24.76	.47	4	87.6	24.38	64.2	59.1	43.94	.88	2
44	29.9	24.9	24.77	.46	4	87.7	24.82	64.7	59.8	44.93	.88	2
45	29.3	24.4	24.78	.45	5	87.7	25.27	65.2	60.4	45.91	.89	2
46	28.8	24.0	24.79	.45	5	87.8	25.71	65.7	60.9	46.90	.89	2
47	28.2	23.5	24.80	.44	5	87.8	26.16	66.1	61.4	47.88	.90	2
48	27.7	23.1	24.80	.43	5	87.8	26.61	66.5	61.9	48.87	.90	2
49	27.2	22.7	24.81	.42	5	87.9	27.06	67.0	624	49.85	.90	2
50	26.8	22.3	24.82	.42	5	87.9	27.52	67.4	62.9	50.84	.91	2
51	26.3	21.9	24.82	.41	5	87.9	27.97	67.8	63.4	51.82	.91	2
52	25.8	21.5	24.83	.40	5	88.0	28.43	68.1	638	52.81	.91	2

23 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
53	25.4	21.2	24.84	.40	5	88.0	28.89	68.5	64.3	53.80	.92	1
54	25.0	20.8	24.84	.39	5	88.0	29.35	68.9	64.7	54.79	.92	1
55	24.6	20.5	24.85	.38	5	88.1	29.81	69.2	65.1	55.77	.92	1
56	24.2	20.2	24.85	.38	5	88.1	30.27	69.6	65.5	56.76	.92	1
57	23.8	19.8	24.86	.37	5	88.1	30.73	69.9	65.9	57.75	.93	1
58	23.4	19.5	24.86	.37	5	88.2	31.20	70.2	66.3	58.74	.93	1
59	23.1	19.2	24.86	.36	5	88.2	31.66	70.5	66.6	59.73	.93	1
60	22.7	18.9	24.87	.36	5	88.2	32.13	70.8	67.0	60.72	.93	1
61	22.4	18.6	24.87	.35	5	88.2	32.60	71.1	67.3	61.71	.93	1
62	22.1	18.3	24.88	.35	5	88.3	33.06	71.4	67.6	62.70	.94	1
63	21.8	18.1	24.88	.34	5	88.3	33.53	71.7	68.0	63.69	.94	1
64	21.4	17.8	24.88	.34	5	88.3	34.00	71.9	68.3	64.68	.94	1
65	21.1	17.5	24.89	.33	5	88.3	34.47	72.0	68.6	65.67	.94	1
66	20.8	17.3	24.89	.33	5	88.4	34.95	72.4	68.9	66.66	.94	1
67	20.5	17.7	24.89	.32	5	88.4	35.42	72.7	69.2	67.65	.94	1
68	20.3	16.8	24.89	.32	5	88.4	35.89	72.9	69.5	68.64	.94	1
69	20.0	16.6	24.90	.31	5	88.4	36.37	73.1	69.8	69.63	.95	1
70	19.6	16.4	24.90	.31	5	88.4	36.84	73.4	70.1	70.62	.95	1
71	19.4	16.2	24.90	.30	5	88.5	37.32	73.6	70.3	71.61	.95	1
72	19.2	16.0	24.91	.30	5	88.5	37.79	73.8	70.6	72.61	.95	1
73	18.9	15.7	24.91	.30	5	88.5	38.27	74.0	70.9	73.60	.95	1
74	18.7	15.5	24.91	.29	5	88.5	38.75	74.2	71.1	74.59	.95	1
75	18.4	15.3	24.91	.29	5	88.5	39.22	74.4	71.3	75.59	.95	1
76	18.2	15.1	24.91	.29	5	88.6	39.70	74.6	71.6	76.58	.95	1
77	18.0	15.0	24.92	.28	5	88.6	40.18	74.8	71.8	77.57	.96	1
78	17.8	14.8	24.92	.28	5	88.6	40.66	75.0	72.0	78.57	.96	1
79	17.5	14.6	24.92	.28	5	88.6	41.14	75.2	72.2	79.56	.96	1
80	17.3	14.4	24.92	.27	5	88.6	41.62	75.4	72.5	80.55	.96	1
81	17.1	14.3	24.92	.27	5	88.6	42.10	75.5	72.7	81.55	.96	1
82	16.9	14.1	24.93	.27	5	88.7	42.58	75.7	72.9	82.54	.96	1

	PINION					PINION AND GEAR		GEAR				
23 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
83	16.7	13.9	24.93	.26	5	88.7	43.06	75.9	73.1	83:53	.96	1
84	16.5	13.8	24.93	.26	5	88.7	43.55	76.0	73.3	84.53	.96	1
85	16.4	13.6	24.93	.26	5	88.7	44.03	76.2	73.4	85.52	.96	1
86	16.2	13.5	24.93	.26	5	88.7	44.51	76.4	73.6	86.52	.96	1
87	16.0	13.3	24.93	.25	5	88.7	44.99	76.5	73.8	87.51	.96	1
88	15.8	13.2	24.93	.25	5	88.7	45.48	76.7	74.0	88.51	.96	1
89	15.7	13.0	24.94	.25	5	88.7	45.96	76.8	74.1	89.50	.97	1
90	15.5	12.9	24.94	.24	5	88.8	46.45	77.0	74.3	90.49	.97	1
91	15.3	12.7	24.94	.24	5	88.8	46.93	77.1	74.5	91.49	.97	1
92	15.2	12.6	24.94	.24	5	88.8	47.42	77.2	74.6	92.49	.97	1
93	15.0	12.5	24.94	.24	5	88.8	47.90	77.3	74.8	93.48	.97	1
94	14.9	12.4	24.94	.24	5	88.8	48.39	77.5	74.9	94.48	.97	1
95	14.7	12.2	24.94	.23	5	88.8	48.87	77.6	75.1	95.47	.97	1
96	14.6	12.1	24.94	.23	5	88.8	49.36	77.7	75.2	96.47	.97	1
97	14.4	12.0	24.95	.23	5	88.8	49.84	77.8	75.4	97.46	.97	1
98	14.3	11.9	24.95	.23	5	88.9	50.33	78.0	75.5	98.46	.97	1
99	14.1	11.8	24.95	.22	5	88.9	50.82	78.1	75.7	99.45	.97	1
100	14.0	11.7	24.95	.22	5	88.9	51.31	78.2	75.8	100.45	.97	1
101	13.9	11.5	24.95	.22	5	88.9	51.79	78.3	76.0	101.45	.97	1
102	13.7	11.4	24.95	.22	5	88.9	52.28	78.4	76.1	102.44	.97	1
103	13.6	11.3	24.95	.22	5	88.9	52.77	78.5	76.2	103.44	.97	1
104	13.5	11.2	24.95	.21	5	88.9	53.26	78.6	76.3	104.43	.97	1
105	13.4	11.1	24.95	.21	5	88.9	53.74	78.7	76.5	105.43	.97	1
106	13.2	11.0	24.95	.21	5	88.9	54.23	78.8	76.6	106.43	.97	1
107	13.1	10.9	24.95	.21	5	88.9	54.72	78.9	76.7	107.42	.97	1
108	13.0	10.8	24.96	.21	5	89.0	55.21	79.0	76.8	108.42	.98	1
109	12.9	10.7	24.96	.21	5	89.0	55.70	79.1	76.9	109.42	.98	1
110	12.8	10.6	24.96	.20	5	89.0	56.19	79.2	77.1	110.41	.98	1
111	12.7	10.5	24.96	.20	5	89.0	56.68	79.3	77.2	111.41	.98	1
112	12.5	10.4	24.96	.20	5	89.0	57.17	79.4	77.3	112.40	.98	1

	PINION					PINION AND GEAR		GEAR				
23 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
113	12.4	10.3	24.96	.20	5	89.0	57.66	79.5	77.4	113.40	.98	1
114	12.3	10.3	24.96	.20	5	89.0	58.15	79.6	77.5	114.40	.98	1
115	12.2	10.2	24.96	.19	5	89.0	58.64	79.7	77.6	115.39	.98	1
116	12.1	10.1	24.96	.19	5	89.0	59.13	79.8	77.7	116.39	.98	1
117	12.0	10.0	24.96	.19	5	89.0	59.62	79.9	77.8	117.39	.98	1
118	11.9	9.9	24.96	.19	5	89.0	60.11	80.0	77.9	118.38	.98	1
119	11.8	9.8	24.96	.19	5	89.0	60.60	80.0	78.0	119.38	.98	1
120	11.7	9.8	24.96	.19	5	89.1	61.09	80.1	78.1	120.38	.98	1
121	11.7	9.7	24.96	.18	5	89.1	61.58	80.2	78.2	121.37	.98	1
122	11.6	9.6	24.97	.18	5	89.1	62.07	80.3	78.3	122.37	.98	1
123	11.5	9.5	24.97	.18	5	89.1	62.57	80.4	78.4	123.37	.98	1
124	11.4	9.4	24.97	.18	5	89.1	63.06	80.4	78.5	124.36	.98	1
125	11.3	9.4	24.97	.18	5	89.1	63.55	80.5	78.6	125.36	.98	1
126	11.2	9.3	24.97	.18	5	89.1	64.04	80.6	78.7	126.36	.98	1
127	11.1	9.2	24.97	.18	5	89.1	64.53	80.7	78.8	127.36	.98	1
128	11.0	9.1	24.97	.17	5	89.1	65.02	80.7	78.8	128.35	.98	1
129	10.9	9.1	24.97	.17	5	89.1	65.52	80.8	78.9	129.35	.98	1
130	10.9	9.0	24.97	.17	5	89.1	66.01	80.9	79.0	130.35	.98	1
131	10.8	8.9	24.97	.17	5	89.1	66.50	80.9	79.1	131.35	.98	1
132	10.7	8.9	24.97	.17	5	89.1	66.99	81.0	79.2	132.34	.98	1

	PINION					PINION AND GEAR		GEAR				
24 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE. ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
24	48.4	41.1	25.41	.70	4	86.6	16.97					
25	47.1	40.0	25.44	.69	4	86.7	17.33	49.4	42.4	26.38	.72	3
26	46.0	39.0	25.47	.67	4	86.8	17.69	50.5	43.5	27.35	.73	3
27	44.8	38.0	25.50	.66	4	86.8	18.06	51.5	44.7	28.33	.75	3
28	43.7	37.0	25.52	.65	4	86.9	18.44	52.5	45.8	29.30	.76	3
29	42.6	36.1	25.54	.63	4	87.0	18.82	53.4	46.9	30.27	.77	3
30	41.6	35.2	25.56	.62	4	87.0	19.21	54.3	47.9	31.25	.78	3
31	40.7	34.4	25.58	.61	4	87.1	19.60	55.1	48.9	32.22	.79	3
32	39.7	33.6	25.60	.60	4	87.1	20.00	56.0	49.8	33.20	.80	3
33	38.8	32.8	25.62	.58	4	87.2	20.40	56.7	50.7	34.17	.81	2
34	38.0	32.1	25.64	.57	4	87.2	20.81	57.5	51.6	35.15	.82	2
35	37.1	31.3	25.65	.56	4	87.3	21.22	58.2	52.4	36.13	.82	2
36	36.3	30.6	25.67	.55	4	87.3	21.63	58.9	53.2	37.11	.83	2
37	35.6	30.0	25.68	.54	4	874	22.05	59.6	54.0	38.09	.84	2
38	34.8	29.3	25.69	.53	4	874	22.47	60.3	54.8	39.07	.84	2
39	34.1	28.7	25.70	.52	4	87.5	22.90	60.9	55.5	40.05	.85	2
40	33.4	28.1	25.72	.51	4	87.5	23.32	61.5	56.2	41.03	.86	2
41	32.7	27.6	25.73	.50	4	87.6	23.75	62.0	56.9	42.01	.86	2
42	32.1	27.0	25.74	.49	4	87.6	24.19	62.6	57.5	42.99	.87	2
43	31.5	26.5	25.75	.49	4	87.7	24.62	63.1	58.1	43.98	.87	2
44	30.9	26.0	25.76	.48	4	87.7	25.06	63.7	58.7	44.96	.87	2
45	30.3	25.5	25.77	47	4	87.7	25.50	64.2	59.3	45.94	88	2
46	29.8	25.0	25.77	.46	4	87.8	25.94	64.6	59.9	46.93	.88	2
47	29.2	24.6	25.78	.45	4	87.8	26.39	65.1	60.4	47.91	.89	2
48	28.7	24.1	25.79	.45	4	87.9	26.83	65.6	61.0	48.90	.89	2
49	28.2	23.7	25.80	.44	4	87.9	27.28	66.0	61.5	49.88	.90	2
50	27.7	23.3	25.80	.43	4	87.9	27.73	66.4	62.0	50.87	.90	2
51	27.2	22.9	25.81	.42	4	88.0	28.18	66.8	62.5	51.85	.90	2
52	26.8	22.5	25.82	.42	4	88.0	28.64	67.2	62.9	52.84	.91	2
53	26.3	22.1	25.82	.41	4	88.0	29.09	67.6	63.4	53.83	.91	2

24 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH DIVIDE BY PITCH	NO OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
54	25.9	21.8	25.83	.40	4	88.1	29.55	68.0	63.8	54.81	.91	2
55	25 5	21.4	25.83	.40	4	88.1	30.00	68.3	64.2	55.80	.91	1
56	25.1	21.0	25.84	.39	4	88.1	30.46	68.7	64.6	56.79	.92	1
57	24.7	20.7	25.84	39	4	88.1	30.92	69.0	65.0	57.78	.92	1
58	24.3	20.4	25.85	38	4	88.2	31.38	69.3	65.4	58.77	.92	1
59	24.0	20.1	25.85	37	4	88.2	31.85	69.6	65.8	59.75	92	1
60	23.6	19.8	25.86	37	4	88.2	32.31	70.0	66.1	60.74	.93	1
61	23 2	19 5	25.86	36	4	88.2	32.78	70 3	66 5	61.73	.93	1
62	22.9	19.2	25.87	36	5	88.3	33.24	70.6	66.8	62.72	93	1
63	22.6	18 9	25.87	35	5	88.3	33.71	70.8	67.2	63.71	93	1
64	22 2	18.6	25.87	.35	5	88.3	34.18	71.1	67.5	64.70	.93	1
65	21 9	18.4	25.88	.34	5	88.3	34.64	71.4	67.8	65.69	94	1
66	21.6	18 1	25.88	34	5	88.4	35.11	71.6	68.1	66.68	.94	1
67	21 3	17.9	25.88	.33	5	88.4	35.58	71.9	68.4	67 67	94	1
68	21.0	17 6	25.89	33	5	88.4	36.06	72.1	68.7	68 66	94	1
69	20.8	17.4	25.89	33	5	88.4	36.53	72.4	69.0	69.66	94	1
70	20.4	17.1	25.89	.32	5	88.4	37.00	72.9	69.3	70.55	.94	1
71	20.2	16.9	25.90	.32	5	88.5	37.47	73.1	69.6	71.64	.95	1
72	19.9	16.7	25.90	31	5	88.5	37.95	73.3	69.9	72.63	.95	1
73	19.6	16.5	25.90	.31	5	88.5	38.42	73.5	70.1	73.62	.95	1
74	19.4	16.3	25.90	.31	5	88.5	38.90	73.7	70.4	74.62	.95	1
75	19.1	16.1	25.90	.30	5	88.5	39.37	73.9	70.6	75.61	.95	1
76	18.9	15.9	25.91	.30	5	88.6	39.85	74.1	70.9	76.60	.95	1
77	18.7	15.7	25.91	.29	5	88.6	40.33	74.3	71.1	77.59	.95	1
78	18.5	15.5	25.91	.29	5	88.6	40.80	74.5	71.3	78.59	.95	1
79	18.2	15.3	25.91	29	5	88.6	41.28	74.7	71.6	79.58	.95	1
80	18.0	15.1	25.92	.28	5	88.6	41.76	74.9	71.8	80.57	.96	1
81	17.8	14.9	25.92	.28	5	88.6	42.24	75.1	72.0	81.57	.96	1
82	17.6	14.8	25.92	.28	5	88.7	42.72	75.2	72.2	82.56	.96	1
83	17.4	14.6	25.92	.28	5	88.7	43.20	75.4	72.4	83.56	.96	1

24 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
84	17.2	14.4	25.92	.27	5	88.7	43.68	75.4	72.6	84.55	.96	1
85	17.0	14.3	25.92	.27	5	88.8	44.16	75.5	72.8	85.54	.96	1
86	16.8	14.1	25.93	.27	5	88.8	44.64	75.7	73.0	86.54	.96	1
87	16.6	14.0	25.93	.26	5	88.8	45.12	75.9	73.2	87.53	.96	1
88	16.4	13.8	25.93	.26	5	88.8	45.61	76.0	73.4	88.53	.96	1
89	16.3	13.6	25.93	.26	5	88.8	46.09	76.2	73.5	89.52	.96	1
90	16.1	13.5	25.93	.25	5	88.8	46.57	76.3	73.7	90.51	.96	1
91	15.9	13.3	25.93	.25	5	88.8	47.06	76.5	73.9	91.51	.96	1
92	15.8	13.2	25.93	.25	5	88.8	47.54	76.6	74.0	92.50	.96	1
93	15.6	13.1	25.94	.25	5	88.8	48.02	76.8	74.2	93.50	.97	1
94	15.5	12.9	25.94	.24	5	88.8	48.51	76.9	74.4	94.49	.97	1
95	15.3	12.8	25.94	.24	5	88.8	48.99	77.0	74.5	95.49	.97	1
96	15.1	12.7	25.94	.24	5	88.8	49.48	77.1	74.7	96.49	.97	1
97	15.0	12.6	25.94	.24	5	88.8	49.96	77.3	74.8	97.48	.97	1
98	14.9	12.4	25.94	.24	5	88.9	50.45	77.4	75.0	98.48	.97	1
99	14.7	12.3	25.94	.23	5	88.9	50.93	77.5	75.1	99.47	.97	1
100	14.6	12.2	25.94	.23	5	88.9	51.42	77.6	75.2	100.47	.97	1
101	14.4	12.1	25.95	.23	5	88.9	51.91	77.8	75.4	101.46	.97	1
102	14.3	12.0	25.95	.23	5	88.9	52.39	77.9	75.5	102.46	.97	1
103	14.2	11.9	25.95	.23	5	88.9	52.88	78.0	75.7	103.46	.97	1
104	14.0	11.7	25.95	.22	5	88.9	53.37	78.1	75.8	104.45	.97	1
105	13.9	11.6	25.95	.22	5	88.9	53.85	78.2	76.0	105.45	.97	1
106	13.8	11.5	25.95	.22	5	88.9	54.35	78.3	76.1	106.44	.97	1
107	13.6	11.4	25.95	.22	5	88.9	54.83	78.4	76.2	107.44	.97	1
108	13.5	11.3	25.95	.22	5	89.0	55.32	78.5	76.3	108.44	.97	1
109	13.4	11.2	25.95	.21	5	89.0	55.81	78.6	76.4	109.43	.97	1
110	13.3	11.1	25.95	.21	5	89.0	56.29	78.7	76.5	110.43	.97	1
111	13.2	11.0	25.95	.21	5	89.0	56.78	78.8	76.7	111.42	.97	1
112	13.1	10.9	25.95	.21	5	89.0	57.27	78.9	76.8	112.42	.97	1
113	12.9	10.8	25.96	.21	5	89.0	57.76	79.0	76.9	113.42	.98	1

24 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
114	12.8	10.7	25.96	.20	5	89.0	58.25	79.1	77.0	114.41	.98	1
115	12.7	10.6	25.96	.20	5	89.0	58.74	79.2	77.2	115.41	.98	1
116	12.6	10.6	25.96	.20	5	89.0	59.23	79.3	77.3	116.41	.98	1
117	12.5	10.5	25.96	.20	5	89.0	59.72	79.4	77.4	117.40	.98	1
118	12.4	10.4	25.96	.20	5	89.0	60.21	79.5	77.5	118.40	.98	1
119	12.3	10.3	25.96	.20	5	89.0	60.70	79.6	77.6	119.40	.98	1
120	12.2	10.2	25.96	.19	5	89.1	61.19	79.7	77.7	120.39	.98	1
121	12.1	10.1	25.96	.19	5	89.1	61.68	79.7	77.8	121.39	.98	1
122	12.0	10.0	25.96	.19	5	89.1	62.17	79.8	77.9	122.39	.98	1
123	11.9	10.0	25.96	.19	5	89.1	62.66	79.9	80.0	123.38	.98	1
124	11.8	9.9	25.96	.19	5	89.1	63.15	80.0	80.0	124.38	.98	1
125	11.7	9.8	25.96	.19	5	89.1	63.64	80.0	80.1	125.38	.98	1
126	11.6	9.8	25.96	.18	5	89.1	64.13	80.1	80.2	126.37	.98	1
127	11.5	9.7	25.96	.18	5	89.1	64.62	80.2	80.3	127.37	.98	1
128	11.4	9.6	25.97	.18	5	89.1	65.12	80.3	80.4	128.37	.98	1
129	11.4	9.5	25.97	.18	5	89.1	65.60	80.4	80.5	129.37	.98	1
130	11.3	9.4	25.97	.18	5	89.1	66.10	80.4	80.6	130.36	.98	1
131	11.2	9.4	25.97	.18	5	89.1	66.59	80.5	80.7	131.36	.98	1
132	11.1	9.3	25.97	.18	5	89.1	67.08	80.6	80.7	132.36	.98	1

25 TEETH INTO	PINION FACE ANGLE	PINION CUTTING ANGLE	PINION OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	PINION BACKING FOR PITCH. DIVIDE BY PITCH	PINION NO. OF CUTTER TO USE	PINION AND GEAR BACK ANGLE	PINION AND GEAR PITCH CONE RADIUS. DIVIDE BY PITCH	GEAR FACE ANGLE	GEAR CUTTING ANGLE	GEAR OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	GEAR BACKING FOR 1 PITCH. DIVIDE BY PITCH	GEAR NO. OF CUTTER TO USE
25	48.2	41.3	26.41	.70	3	86.8	17.68					
26	47.0	40.2	26.44	.69	4	86.8	18.03	49.2	42.5	27.39	.72	3
27	45.9	39.2	26.47	.68	4	86.9	18.40	50.3	43.6	28.36	.73	3
28	44.8	38.2	26.49	.66	4	86.9	18.77	51.3	44.8	29.33	.74	3
29	43.7	37.3	26.52	.65	4	87.0	19.14	52.2	45.8	30.30	.76	3
30	42.7	36.4	26.54	.64	4	87.1	19.52	53.1	46.9	31.28	.77	3
31	41.7	35.6	26.56	.62	4	87.1	19.91	54.0	47.8	32.25	.78	3
32	40.8	34.8	26.58	.61	4	87.2	20.30	54.8	48.8	33.23	.79	3
33	39.9	34.0	26.59	.60	4	87.2	20.70	55.6	49.7	34.21	.79	2
34	39.0	33.2	26.61	.59	4	87.3	21.10	56.4	50.6	35.18	.80	2
35	38.2	32.5	26.63	.58	4	87.3	21.51	57.1	51.4	36.16	.81	2
36	37.4	31.8	26.65	.57	4	87.4	21.91	57.8	52.2	37.14	.82	2
37	36.6	31.1	26.66	.56	4	87.4	22.33	58.5	53.0	38.12	.83	2
38	35.8	30.4	26.67	.55	4	87.5	22.74	59.2	53.8	39.10	.83	2
39	35.1	29.8	26.69	.54	4	87.5	23.16	59.8	54.5	40.08	.84	2
40	34.4	29.2	26.70	.53	4	87.6	23.58	60.4	55.2	41.06	.85	2
41	33.7	28.6	26.71	.52	4	87.6	24.01	61.0	55.9	42.04	.85	2
42	33.1	28.0	26.72	.51	4	87.6	24.44	61.6	56.5	43.02	.86	2
43	32.5	27.5	26.73	.50	4	87.7	24.87	62.1	57.2	44.01	.86	2
44	31.9	27.0	26.74	.49	4	87.7	25.30	62.7	57.8	44.99	.87	2
45	31.3	26.5	26.75	.48	4	87.8	25.74	63.2	58.4	45.97	.87	2
46	30.7	26.0	26.76	.48	4	87.8	26.18	63.6	58.9	46.96	.88	2
47	30.2	25.6	26.77	.47	4	87.8	26.62	64.1	59.5	47.94	.88	2
48	29.6	25.1	26.77	.46	4	87.9	27.06	64.6	60.1	48.93	.88	2
49	29.1	24.6	26.78	.45	4	87.9	27.50	65.0	60.6	49.91	.89	2
50	28.6	24.2	26.79	.45	4	87.9	27.95	65.5	61.1	50.90	.89	2
51	28.1	23.8	26.80	.44	4	88.0	28.40	65.9	61.6	51.88	.90	2
52	27.6	23.4	26.80	.43	4	88.0	28.85	66.3	62.0	52.87	.90	2
53	27.2	23.0	26.81	.43	4	88.0	29.30	66.7	62.5	53.86	.90	2
54	26.7	22.6	26.82	.42	4	88.1	29.75	67.1	63.0	54.84	.91	2

	PINION					PINION AND GEAR		GEAR				
25 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
55	26.3	22.4	26.82	.41	4	88.1	30.21	67.4	63.4	55.83	.91	2
56	25.9	21.9	26.83	.41	4	88.1	30.66	67.8	63.8	56.82	.91	1
57	25.5	21.6	26.83	.40	4	88.2	31.12	68.1	64.2	57.81	.91	1
58	25.1	21.2	26.84	.39	4	88.2	31.58	68.5	64.6	58.79	.92	1
59	24.7	20.9	26.84	.39	4	88.2	32.09	68.8	65.0	59.78	.92	1
60	24.4	20.6	26.85	.38	4	88.2	32.50	69.1	65.4	60.77	.92	1
61	24.0	20.3	26.85	.38	4	88.3	32.96	69.5	65.7	61.76	.92	1
62	23.7	20.0	26.86	.37	4	88.3	33.43	69.7	66.1	62.75	.93	1
63	23.3	19.7	26.86	.37	4	88.3	33.89	70.0	66.4	63.74	.93	1
64	23.0	19.4	26.86	36	4	88.3	3435	70.3	66.8	64.73	.93	1
65	22.7	19.1	26.87	.36	4	88.4	34.82	70.6	67.1	65.72	.93	1
66	22.4	18.9	26.87	.35	4	88.4	35.29	70.9	67.4	66.71	.93	1
67	22.1	18.6	26.87	.35	4	884	35.76	71.1	67.7	67.70	.93	1
68	21.8	18.3	26.88	.34	4	88.4	36.22	71.4	68.0	68.69	.94	1
69	21.5	18.1	26.88	.34	4	88.4	36.69	71.6	68.3	69.68	.94	1
70	21.1	17.8	26.88	.33	4	88.5	37.16	71.9	68.6	70.67	.94	1
71	20.8	17.6	26.89	.33	4	88.5	3764	72.2	68.9	71.66	.94	1
72	20.6	17.4	26.89	32	4	88.5	38.11	72.4	69.2	72.65	.94	1
73	20.3	17.2	26.89	.32	4	88.5	38.58	72.6	69.4	73.65	.94	1
74	20.1	17.0	26.89	.32	4	88.5	39.05	72.8	69.7	74.64	.94	1
75	19.8	16.7	26.90	.31	4	88.5	39.53	73.0	70.0	75.63	.95	1
76	19.6	16.5	26.90	.31	4	88.6	40.00	73.3	70.2	76.62	.95	1
77	19.3	16.3	26.90	.31	4	88.6	40.48	73.5	70.5	77.62	.95	1
78	19.1	16.1	26.90	.30	4	88.6	40.95	73.7	70.7	78.61	.95	1
79	18.9	15.9	26.91	.30	4	88.6	41.43	73.9	70.9	79.60	.95	1
80	18.7	15.7	26.91	.29	4	88.6	41.91	74.0	71.1	80.59	.95	1
81	18.4	15.5	26.91	.29	4	88.6	4238	74.2	71.4	81.59	.95	1
82	18.2	15.4	26.91	.29	4	88.7	4286	74.4	71.6	82.58	.95	1
83	18.0	15.2	26.91	.29	4	88.7	43.34	74.6	71.8	83.58	.95	1
84	17.8	15.0	26.92	.28	4	88.7	43.82	74.8	72.0	84.57	.96	1

	PINION					PINION AND GEAR		GEAR				
25 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
85	17.6	14.9	26.92	.28	4	88.7	44.30	74.9	72.2	85.56	.96	1
86	17.4	14.7	26.92	.28	4	88.7	44.78	75.1	72.4	86.56	.96	1
87	17.2	14.6	26.92	.27	4	88.7	45.26	75.3	72.6	87.55	.96	1
88	17.0	14.4	26.92	.27	4	88.7	45.74	75.4	72.8	88.55	.96	1
89	16.9	14.2	26.93	.27	4	88.8	46.22	75.6	72.9	89.54	.96	1
90	16.7	14.1	26.93	.26	4	88.8	46.70	75.8	73.1	90.53	.96	1
91	16.5	13.9	26.93	.26	4	88.8	47.19	75.9	73.3	91.53	.96	1
92	16.3	13.8	26.93	.26	4	88.8	47.67	76.0	73.5	92.52	.96	1
93	16.2	13.6	26.93	.26	4	88.8	48.15	76.2	73.7	93.52	.96	1
94	16.0	13.5	26.93	.25	4	88.8	48.63	76.3	73.8	94.51	.96	1
95	15.8	13.3	26.93	.25	4	88.8	49.12	76.5	74.0	95.51	.96	1
96	15.7	13.2	26.93	.25	4	88.8	49.60	76.6	74.1	96.50	.96	1
97	15.5	13.1	26.94	.25	5	88.8	50.08	76.7	74.3	97.50	.97	1
98	15.4	13.0	26.94	.24	5	88.9	50.57	76.9	74.4	98.49	.97	1
99	15.2	12.8	26.94	.24	5	88.9	51.05	77.0	74.6	99.49	.97	1
100	15.1	12.7	26.94	.24	5	88.9	51.54	77.1	74.7	100.49	.97	1
101	15.0	12.6	26.94	.24	5	88.9	52.02	77.3	74.9	101.48	.97	1
102	14.8	12.5	26.94	.24	5	88.9	52.51	77.4	75.0	102.48	.97	1
103	14.7	12.4	26.94	.23	5	88.9	53.00	77.5	75.2	103.47	.97	1
104	14.5	12.2	26.94	.23	5	88.9	53.48	77.6	75.3	104.47	.97	1
105	14.4	12.1	26.95	.23	5	88.9	53.97	77.7	75.4	105.46	.97	1
106	14.3	12.0	26.95	.23	5	88.9	54.45	77.8	75.6	106.46	.97	1
107	14.1	11.9	26.95	.23	5	88.9	54.94	77.9	75.7	107.46	.97	1
108	14.0	11.8	26.95	.22	5	89.0	55.43	78.0	75.8	108.45	.97	1
109	13.9	11.7	26.95	.22	5	89.0	55.91	78.1	76.0	109.45	.97	1
110	13.7	11.6	26.95	.22	5	89.0	56.40	78.2	76.1	110.45	.97	1
111	13.6	11.5	26.95	.22	5	89.0	56.89	78.3	76.2	111.44	.97	1
112	13.5	11.4	26.95	.22	5	89.0	57.38	78.4	76.3	112.44	.97	1
113	13.4	11.3	26.95	.21	5	89.0	57.87	78.5	76.5	113.43	.97	1
114	13.3	11.2	26.95	.21	5	89.0	58.35	78.6	76.6	114.43	.97	1

	PINION					PINION AND GEAR		GEAR				
25 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
115	13.2	11.1	26.95	.21	5	89.0	58.84	78.7	76.7	115.43	.92	1
116	13.0	11.0	26.95	.21	5	89.0	59.33	78.8	76.8	116.42	.92	1
117	12.9	10.9	26.95	.21	5	89.0	59.82	78.9	76.9	117.42	.92	1
118	12 8	10.8	26.96	.21	5	89.0	60.31	79.0	77.0	118.42	.93	1
119	12.7	10.7	26.96	.20	5	89.1	60.80	79.1	77.1	119.41	.93	1
120	12.6	10.6	26.96	.20	5	89.1	61.29	79.2	77.2	120.41	.93	1
121	12 5	10.6	26.96	.20	5	89.1	61.78	79.3	77.3	121.41	.93	1
122	12.4	10.5	26.96	.20	5	89.1	62.27	79.4	77.4	122.40	.93	1
123	12.3	10.4	26.96	.20	5	89.1	62.76	79.5	77.5	123 40	.93	1
124	12.2	10.3	26.96	.20	5	89.1	63.25	79 5	77 6	124.40	.93	1
125	12.1	10.2	26.96	.19	5	89.1	63.74	79.6	77.7	125.39	.93	1
126	12.1	10.2	26.96	.19	5	89.1	64.23	79.7	77.8	126.39	.93	1
127	12.0	10.1	26.96	.19	5	89.1	64.72	79.8	77.9	127.39	.93	1
128	11.9	10.0	26.96	.19	5	89.1	65.21	79.8	78.0	128.38	.93	1
129	11.8	10.0	26.96	.19	5	89 1	65.70	79.9	78.1	129.38	.93	1
130	11.7	9.9	26.96	.19	5	89.1	66.19	80.0	78.2	130.38	.93	1
131	11.6	9.8	26.96	.19	5	89.1	66.68	80.1	78.2	131.38	.93	1
132	11.5	9.7	26.96	.18	5	89 1	67.17	80.2	78 3	132 37	.93	1

26 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY. PITCH	NO. OF CUTTER TO USE
26	48.1	41.4	27.41	.70	3	86.9	18.38					
27	46.9	40.4	27.44	.69	3	86.9	18.74	49.1	42.6	28.39	.72	3
28	45.9	39.4	27.47	.68	3	87.0	19.10	50.1	43.7	29.36	.73	3
29	44.8	38.5	27.49	.66	3	87.1	19.47	51.1	44.7	30.33	.74	3
30	43.8	37.6	27.51	.65	4	87.1	19.85	52.0	45.8	31.31	.75	3
31	42.8	36.7	27.53	.64	4	87.2	20.23	52.8	46.8	32.28	.76	3
32	41.9	35.9	27.55	.63	4	87.2	20.62	53.7	47.7	33.26	.77	3
33	41.0	35.1	27.57	.62	4	87.3	21.01	54.5	48.6	34.24	.78	3
34	40.1	34.3	27.59	.60	4	87.3	21.40	55.2	49.5	35.21	.79	2
35	39.2	33.6	27.61	.59	4	87.4	21.80	56.0	50.4	36.19	.80	2
36	38.4	32.9	27.62	.58	4	87.4	22.20	56.7	51.2	37.17	.81	2
37	37.6	32.2	27.64	.57	4	87.5	22.61	57.4	52.0	38.15	.82	2
38	36.9	31.5	27.65	.56	4	87.5	23.02	58.1	52.8	39.13	.82	2
39	36.1	30.9	27.67	.55	4	87.6	23.44	58.7	53.5	40.11	.83	2
40	35.4	30.3	27.68	.54	4	87.6	23.85	59.8	54.2	41.09	.84	2
41	34.8	29.7	27.69	.53	4	87.6	24.27	60.0	54.9	42.07	.84	2
42	34.1	29.1	27.70	.52	4	87.7	24.70	60.5	55.6	43.05	.85	2
43	33.5	28.5	27.71	.52	4	87.7	25.13	61.1	56.2	44.04	.85	2
44	32.8	28.0	27.72	.51	4	87.8	25.55	61.7	56.8	45.02	.86	2
45	32.2	27.5	27.73	.50	4	87.8	25.98	62.2	57.4	46.00	.86	2
46	31.7	27.0	27.74	.49	4	87.8	26.42	62.7	58.0	46.99	.87	2
47	31.1	26.5	27.75	.48	4	87.9	26.86	63.2	58.6	47.97	.87	2
48	30.6	26.0	27.76	.47	4	87.9	27.29	63.6	59.1	48.95	.88	2
49	30.0	25.6	27.77	.47	4	87.9	27.74	64.1	59.6	49.94	.88	2
50	29.5	25.1	27.77	.46	4	88.0	28.18	64.5	60.2	50.92	.88	2
51	29.0	24.7	27.78	.45	4	88.0	28.62	65.0	60.7	51.91	.89	2
52	28.5	24.3	27.79	.45	4	88.0	29.07	65.4	61.2	52.90	.89	2
53	28.1	23.9	27.80	.44	4	88.1	29.52	65.8	61.6	53.88	.90	2
54	27.6	23.5	27.80	.43	4	88.1	29.97	66.2	62.1	54.87	.90	2
55	27.2	23.1	27.81	.43	4	88.1	30.42	66.6	62.5	55.86	.90	2

	PINION					PINION AND GEAR		GEAR				
26 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
56	26.8	22.8	27.81	.42	4	88.1	30.87	67.0	63.0	56.84	.90	2
57	26.3	22.4	27.82	.41	4	88.2	31.32	67.3	63.4	57.83	.91	1
58	25.9	22.1	27.83	.41	4	88.2	31.78	67.6	63.8	58.82	.91	1
59	25.6	21.8	27.83	.40	4	88.2	32.24	68.0	64.1	59.81	.91	1
60	25.2	21.4	27.84	.40	4	88.2	32.70	68.3	64.5	60.80	.92	1
61	24.8	21.1	27.84	.39	4	88.3	33.16	68.6	64.9	61.79	.92	1
62	24.4	20.8	27.85	.38	4	88.3	33.62	68.9	65.3	62.77	.92	1
63	24.1	20.5	27.85	.38	4	88.3	34.08	69.3	65.6	63.76	.92	1
64	23.7	20.2	27.85	.37	4	88.3	34.54	69.5	66.0	64.75	.92	1
65	23.4	19.9	27.86	.37	4	88.4	35.00	69.8	66.3	65.74	.93	1
66	23.1	19.6	27.86	.36	4	88.4	35.47	70.1	66.6	66.73	.93	1
67	22.8	19.4	27.87	.36	4	88.4	35.93	70.4	66.9	67.72	.93	1
68	22.5	19.1	27.87	.35	4	88.4	36.40	70.7	67.3	68.71	.93	1
69	22.2	18.8	27.87	.35	4	88.4	36.87	70.9	67.5	69.70	.93	1
70	21.9	18.6	27.88	.34	4	88.5	37.34	71.2	67.9	70.69	.94	1
71	21.6	18.4	27.88	.34	4	88.5	37.80	71.4	68.2	71.69	.94	1
72	21.3	18.1	27.88	.34	4	88.5	38.27	71.6	68.5	72.68	.94	1
73	21.0	17.9	27.88	.33	4	88.5	38.75	71.9	68.7	73.67	.94	1
74	20.8	17.7	27.89	.33	4	88.5	39.22	72.1	69.0	74.66	.94	1
75	20.5	17.4	27.89	.32	4	88.5	39.69	72.3	69.2	75.65	.94	1
76	20.3	17.2	27.89	.32	4	88.6	40.16	72.5	69.5	76.65	.94	1
77	20.0	17.0	27.89	.32	4	88.6	40.63	72.8	69.8	77.64	.94	1
78	19.8	16.8	27.90	.31	4	88.6	41.11	73.0	70.0	78.63	.95	1
79	19.5	16.6	27.90	.31	4	88.6	41.58	73.2	70.3	79.62	.95	1
80	19.3	16.4	27.90	.31	4	88.6	42.06	73.4	70.5	80.62	.95	1
81	19.1	16.2	27.90	.30	4	88.6	42.53	73.6	70.7	81.61	.95	1
82	18.9	16.0	27.91	.30	4	88.7	43.01	73.8	70.9	82.60	.95	1
83	18.7	15.9	27.91	.30	4	88.7	43.49	73.9	71.2	83.60	.95	1
84	18.4	15.7	27.91	.29	4	88.7	43.97	74.1	71.4	84.59	.95	1
85	18.2	15.5	27.91	.29	4	88.7	44.44	74.3	71.6	85.58	.95	1

26 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
86	18.0	15.3	27.91	.29	4	88.7	44.92	74.5	71.8	86.58	.95	1
87	17.8	15.2	27.92	.28	4	88.7	45.40	74.6	72.0	87.57	.96	1
88	17.6	15.0	27.92	.28	4	88.7	45.88	74.8	72.2	88.57	.96	1
89	17.5	14.9	27.92	.28	4	88.7	46.36	75.0	72.4	89.56	.96	1
90	17.3	14.7	27.92	.28	4	88.8	46.84	75.1	72.5	90.56	.96	1
91	17.1	14.5	27.92	.27	4	88.8	47.32	75.3	72.7	91.55	.96	1
92	16.9	14.4	27.92	.27	4	88.8	47.80	75.4	72.9	92.54	.96	1
93	16.7	14.2	27.93	.27	4	88.8	48.28	75.6	73.1	93.54	.96	1
94	16.6	14.1	27.93	.26	4	88.8	48.76	75.7	73.2	94.53	.96	1
95	16.4	13.9	27.93	.26	4	88.8	49.25	75.9	73.4	95.53	.96	1
96	16.2	13.8	27.93	.26	4	88.8	49.73	76.0	73.6	96.52	.96	1
97	16.1	13.7	27.93	.26	4	88.9	50.21	76.1	73.7	97.52	.96	1
98	15.9	13.5	27.93	.25	4	88.9	50.69	76.3	73.9	98.51	.96	1
99	15.8	13.4	27.93	.25	4	88.9	51.18	76.4	74.0	99.51	.96	1
100	15.6	13.3	27.93	.25	4	88.9	51.66	76.6	74.2	100.50	.96	1
101	15.5	13.1	27.94	.25	4	88.9	52.15	76.7	74.4	101.50	.97	1
102	15.3	13.0	27.94	.24	4	88.9	52.63	76.8	74.5	102.49	.97	1
103	15.2	12.9	27.94	.24	4	88.9	53.11	76.9	74.6	103.49	.97	1
104	15.0	12.8	27.94	.24	4	88.9	53.60	77.1	74.8	104.49	.97	1
105	14.9	12.7	27.94	.24	4	88.9	54.09	77.2	74.9	105.48	.97	1
106	14.8	12.5	27.94	.24	4	88.9	54.57	77.3	75.0	106.48	.97	1
107	14.7	12.4	27.94	.23	4	89.0	55.06	77.4	75.2	107.47	.97	1
108	14.5	12.3	27.94	.23	4	89.0	55.54	77.5	75.3	108.47	.97	1
109	14.4	12.2	27.94	.23	4	89.0	56.03	77.6	75.4	109.47	.97	1
110	14.3	12.1	27.95	.23	4	89.0	56.51	77.7	75.5	110.46	.97	1
111	14.1	12.0	27.95	.23	4	89.0	57.00	77.8	75.7	111.46	.97	1
112	14.0	11.9	27.95	.22	4	89.0	57.49	77.9	75.8	112.45	.97	1
113	13.9	11.8	27.95	.22	4	89.0	57.98	78.0	76.0	113.45	.97	1
114	13.8	11.7	27.95	.22	4	89.0	58.46	78.1	76.1	114.45	.97	1
115	13.7	11.6	27.95	.22	4	89.0	58.95	78.2	76.2	115.44	.97	1

26 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
116	13.5	11.5	27.95	.22	4	89.0	59.44	78.3	76.3	116.44	.97	1
117	13.4	11.4	27.95	.22	4	89.0	59.93	78.4	76.4	117.44	.97	1
118	13.3	11.3	27.95	.21	4	89.0	60.42	78.5	76.5	118.43	.97	1
119	13.2	11.2	27.95	.21	4	89.1	60.90	78.6	76.6	119.43	.97	1
120	13.1	11.1	27.95	.21	4	89.1	61.39	78.7	76.7	120.43	.97	1
121	13.0	11.0	27.95	.21	4	89.1	61.88	78.8	76.8	121.42	.97	1
122	12.9	11.0	27.96	21	4	89.1	62.37	78.9	76.9	122.42	.98	1
123	12.8	10.9	27.96	.21	4	89.1	62.86	79.0	77.0	123.42	.98	1
124	12.7	10.8	27.96	20	4	89.1	63.35	79.1	77.1	124.41	.98	1
125	12.6	10.7	27.96	20	4	89.1	63.84	79.2	77.4	125.41	.98	1
126	12.5	10.6	27.96	.20	4	89.1	64.33	79.3	77.3	126.41	.98	1
127	12.4	10.5	27.96	.20	4	89.1	64.82	79.3	77.5	127.40	.98	1
128	12.3	10.5	27.96	20	4	89.1	65.31	79.4	77.6	128.40	.98	1
129	12.2	10.4	27.96	.20	4	89.1	65.80	79.5	77.7	129.40	.98	1
130	12.1	10.3	27.96	.19	4	89.1	66.29	79.6	77.7	130.39	.98	1
131	12.0	10.2	27.96	.19	4	89.1	66.78	79.7	77.8	131.39	.98	1
132	12.0	10.1	27.96	.19	4	89.1	67.27	79.7	77.9	132.39	.98	1

27 TEETH INTO	PINION FACE ANGLE	PINION CUTTING ANGLE	PINION OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	PINION BACKING FOR 1 PITCH. DIVIDE BY PITCH	PINION NO. OF CUTTER TO USE	PINION AND GEAR BACK ANGLE	PINION AND GEAR PITCH CONE RADIUS. DIVIDE BY PITCH	GEAR FACE ANGLE	GEAR CUTTING ANGLE	GEAR OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	GEAR BACKING FOR 1 PITCH. DIVIDE BY PITCH	GEAR NO. OF CUTTER TO USE
27	48.0	41.5	28.41	.70	3	87.0	19.09					
28	46.9	40.6	28.44	.69	3	87.0	1945	48.9	42.6	2939	.72	3
29	45.9	39.6	28.46	.68	3	87.1	19.81	49.9	43.7	30.36	.73	3
30	44.8	38.7	28.49	.67	3	87.2	20.18	50.8	44.7	31.34	.74	3
31	43.8	37.9	28.51	.65	3	87.2	20.65	51.7	45.7	32.31	.75	3
32	42.9	37.0	28.53	.64	3	87.3	2093	52.5	46.7	33.29	.76	3
33	42.0	36.2	28.55	.63	3	87.3	21.32	53.4	47.6	34.26	.77	3
34	41.1	35.4	28.57	.62	4	87.4	21.71	54.2	48.5	35.24	.78	2
35	40.2	34.7	28.59	.61	4	87.4	22.10	54.9	49.4	36.22	.79	2
36	39.4	34.0	28.60	.60	4	87.5	22.50	55.7	50.2	37.20	.80	2
37	38.6	33.3	28.62	.59	4	87.5	22.90	56.4	51.0	38.18	.81	2
38	37.9	32.6	28.63	.58	4	87.5	23.31	57.0	51.8	39.16	.81	2
39	37.1	31.9	28.65	.57	4	87.6	23.72	57.7	52.5	40.14	.82	2
40	36.4	31.3	28.66	.56	4	87.6	24.13	58.3	53.2	41.12	.83	2
41	35.7	30.7	28.67	.55	4	87.7	24.55	58.9	53.9	42.10	.83	2
42	35.0	30.1	28.68	.54	4	87.7	24.96	59.5	54.6	43.08	.84	2
43	34.4	29.5	28.70	.53	4	87.7	25.39	60.1	55.2	44.06	.85	2
44	33.8	29.0	28.71	.52	4	87.8	25.81	60.7	55.9	45.05	.85	2
45	33.1	28.5	28.72	.51	4	87.8	26.24	61.2	56.5	46.03	.86	2
46	32.6	28.0	28.73	.50	4	87.8	26.67	61.7	57.1	47.01	.86	2
47	32.0	27.5	28.74	.50	4	87.9	27.10	62.2	57.7	48.00	.87	2
48	31.5	27.0	28.74	.49	4	87.9	27.54	62.7	58.2	48.98	.87	2
49	30.9	26.5	28.75	.48	4	87.9	27.97	63.2	58.8	49.97	.87	2
50	30.4	26.0	28.76	.47	4	88.0	28.41	63.6	59.3	50.95	.88	2
51	29.9	25.6	28.77	.47	4	88.0	28.85	64.1	59.8	51.94	.88	2
52	29.4	25.2	28.78	.46	4	88.0	29.30	64.5	60.3	52.92	.89	2
53	28.9	24.8	28.78	.45	4	88.1	29.74	64.9	60.8	53.91	.89	2
54	28.5	24.4	28.79	.45	4	88.1	30.19	65.3	61.3	54.90	.89	2
55	28.0	24.0	28.80	.44	4	88.1	30.63	65.7	61.7	55.88	.90	2
56	27.6	23.6	28.80	.43	4	88.2	31.08	66.1	62.1	56.87	.90	2

27 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
57	27.2	23.2	28.81	.43	4	88.2	31.53	66.5	62.6	57.86	.90	1
58	26.8	22.9	28.81	.42	4	88.2	31.99	66.8	63.0	58.85	.90	1
59	26.4	22.5	28.82	.41	4	88.2	32.44	67.2	63.4	59.83	.91	1
60	26.0	22.2	28.83	.41	4	88.3	32.90	67.5	63.8	60.82	.91	1
61	25.6	21.9	28.83	.40	4	88.3	33.35	67.9	64.1	61.81	.91	1
62	25.2	21.6	28.83	.40	4	88.3	33.81	68.2	64.5	62.80	.91	1
63	24.9	21.3	28.84	.39	4	88.3	34.27	68.5	64.9	63.79	.92	1
64	24.5	21.0	28.84	.39	4	88.3	34.73	68.8	65.2	64.78	.92	1
65	24.2	20.7	28.86	.38	4	88.4	35.19	69.1	65.6	65.77	.92	1
66	23.9	20.4	28.85	.38	4	88.4	35.65	69.4	65.9	66.76	.92	1
67	23.5	20.1	28.86	.37	4	88.4	36.12	69.6	66.2	67.75	.93	1
68	23.2	19.8	28.86	.37	4	88.4	36.58	69.9	66.5	68.74	.93	1
69	22.9	19.6	28.86	.36	4	88.4	37.05	70.2	66.8	69.73	.93	1
70	23.6	19.3	28.87	.36	4	88.5	37.51	70.4	67.2	70.72	.93	1
71	22.3	19.1	28.87	.35	4	88.5	37.98	70.7	67.5	71.71	.93	1
72	22.0	18.8	28.87	.35	4	88.5	38.45	71.0	67.8	72,70	.93	1
73	21.7	18.6	28.88	.34	4	88.5	38.92	71.2	68.1	73.69	.94	1
74	21.5	18.4	28.88	.34	4	88.5	39.39	71.4	68.3	74.68	.94	1
75	21.2	18.1	28.88	.34	4	88.5	39.85	71.7	68.6	75.68	.94	1
76	20.9	17.9	28.88	.33	4	88.6	40.35	71.9	68.9	76.67	.94	1
77	20.7	17.7	28.89	.33	4	88.6	40.80	72.1	69.1	77.66	.94	1
78	20.4	17.5	28.89	.32	4	88.6	41.27	72.3	69.4	78,65	.94	1
79	20.2	17.3	28,89	.32	4	88.6	41.74	72.5	69.6	79.65	.94	1
80	20.0	17.1	28.89	.32	4	88.6	42.22	72.7	69.9	80.64	.94	1
81	19.7	16.9	28.90	.31	4	88.7	42.69	72.9	70.1	81,63	.95	1
82	19.5	16.7	28.90	.31	4	88.7	43.16	73.1	70.3	82.62	.95	1
83	19.3	16.5	28.90	.31	4	88.7	43.64	73.3	70.5	83.62	.95	1
84	19.1	16.3	28.90	.30	4	88.7	44.12	73.5	70.7	84.61	.95	1
85	18.9	16.1	28.91	.30	4	88.7	44.59	73.7	71.0	85.60	.95	1
86	18.7	16.0	28.91	.30	4	88.7	45.07	73.9	71.2	86.60	.95	1

27 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
87	18.5	15.8	28.91	.29	4	88.7	45.55	74.0	71.4	87.59	95	1
88	18.2	15.6	28.91	.29	4	88.7	46.02	74.2	71.6	88.59	.95	1
89	18.0	15.4	28.91	29	4	88.8	46.50	74.4	71.8	89.58	95	1
90	17.9	15.3	28.92	.28	4	88.8	46.98	74.5	72.0	90.57	96	1
91	17.7	15.1	28.92	.28	4	88.8	47.96	74.7	72.2	91.57	96	1
92	17.5	15.0	28.92	.28	4	88.8	47.94	74.8	72.3	92.56	.96	1
93	17.3	14.8	28.92	28	4	88.8	48.42	75.0	72.5	93.56	96	1
94	17.1	14.7	28.92	.27	4	88.8	48.90	75.1	72.7	94.55	96	1
95	17.0	14.5	28.92	.27	4	88.8	49.38	75.3	72.9	95.55	.96	1
96	16.8	14.4	28.92	.27	4	88.8	49.86	75.5	73.0	96.54	.96	1
97	16.6	14.2	28.93	.27	4	88.9	50.34	75.6	73.2	97.54	96	1
98	16.5	14.1	28.93	.26	4	88.9	50.82	75.7	73.3	98.53	96	1
99	16.3	13.9	28.93	.26	4	88.9	51.31	75.9	73.5	99.53	.96	1
100	16.2	13.8	28.93	.26	4	88.9	51.79	76.0	73.7	100.52	.96	1
101	16.0	13.7	28.93	.26	4	88.9	52.27	76.2	73.8	101.52	.96	1
102	15.9	13.6	28.93	.25	4	88.9	52.76	76.3	74.0	102.51	.96	1
103	15.7	13.4	28.93	.25	4	88.9	53.24	76.4	74.1	103.51	.96	1
104	15.6	13.3	28.94	.25	4	88.9	53.72	76.5	74.3	104.50	97	1
105	15.4	13.2	28.94	.25	4	88.9	54.21	76.7	74.4	105.50	.97	1
106	15.3	13.1	28.94	.24	4	88.9	54.69	76.8	74.5	106.49	.97	1
107	15.2	12.9	28.94	.24	4	89.0	55.18	76.9	74.7	107.49	97	1
108	15.0	12.8	28.94	.24	4	89.0	55.66	77.0	74.8	108.49	.97	1
109	14.9	12.7	28.94	.24	4	89.0	56.15	77.1	74.9	109.48	.97	1
110	14.8	12.6	28.94	.24	4	89.0	56.63	77.3	75.1	110.48	.97	1
111	14.6	12.5	28.94	.23	4	89.0	57.12	77.4	75.2	111.47	.97	1
112	14.5	12.4	28.94	.23	4	89.0	57.60	77.5	75.3	112.47	.97	1
113	14.4	12.3	28.94	.23	4	89.0	58.09	77.6	75.5	113.47	.97	1
114	14.2	12.2	28.95	.23	4	89.0	55.58	77.7	75.6	114.46	.97	1
115	14.1	12.1	28.95	.23	4	89.0	59.06	77.8	75.7	115.46	.97	1
116	14.0	12.0	28.95	23	4	89.0	59.55	77.9	75.8	116.46	.97	1

27 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
117	13.9	11.9	28.95	.22	4	89.0	60.04	78.0	75.9	117.45	.97	1
118	13.8	11.8	28.95	.22	4	89.0	60.52	78.1	76.0	118.45	.97	1
119	13.7	11.7	28.95	.22	4	89.1	61.01	78.2	76.2	119.44	.97	1
120	13.6	11.6	28.95	22	4	89.1	61.50	78.3	76.3	120.44	.97	1
121	13.4	11.5	28.95	.22	4	89.1	61.99	78.4	76.4	121.44	.97	1
122	13.3	11.4	28.95	21	4	89.1	62.44	78.5	76.5	122.43	.97	1
123	13.2	11.3	28.95	21	4	89.1	62.96	78.6	76.6	123.43	.97	1
124	13.1	11.2	28.95	21	4	89.1	63.45	78.6	76.7	124.43	.97	1
125	13.0	11.1	28.95	.21	4	89.1	63.94	78.7	76.8	125.42	.97	1
126	12.9	11.1	28.95	21	4	89.1	64.43	78.8	76.9	126.42	.97	1
127	12.8	11.0	28.96	.21	4	89.1	64.92	78.9	77.0	127.42	.98	1
128	12.7	10.9	28.96	.20	4	89.1	65.41	79.0	77.1	128.41	.98	1
129	12.6	10.8	28.96	.20	4	89.1	65.90	79.1	77.2	129.41	.98	1
130	12.5	10.7	28.96	.20	4	89.1	66.39	79.2	77.3	130.41	.98	1
131	12.5	10.6	28.96	.20	4	89.1	66.88	79.2	77.4	131.41	.98	1
132	12.4	10.6	28.96	20	4	89.1	67.36	79.3	77.5	132.40	.98	1

28 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
28	47.9	41.7	29.41	.70	3	87.1	19.80					
29	46.8	40.7	29.44	.69	3	87.2	20.16	48.8	42.7	30.39	.72	3
30	45.8	39.8	29.46	.68	3	87.2	20.52	49.8	43.7	31.36	.73	3
31	44.8	39.0	29.48	.67	3	87.3	20.89	50.6	44.7	3234	.74	3
32	43.9	38.1	29.51	.65	3	87.3	21.26	51.5	45.7	33.31	.75	3
33	43.0	37.3	29.53	.64	3	87.4	21.64	52.3	46.6	34.29	.76	3
34	42.1	36.5	29.54	.63	3	87.4	22.02	53.1	47.5	35.27	.77	3
35	41.2	35.7	29.56	.62	3	87.4	22.41	53.9	48.4	36.25	.78	2
36	40.4	35.0	29.58	.61	3	87.5	22.80	54.6	49.2	37.23	.79	2
37	39.6	34.3	29.60	.60	3	87.5	23.20	55.3	50.0	38.21	.80	2
38	38.8	33.6	29.61	.59	4	87.6	23.60	56.0	50.8	39.18	.80	2
39	38.1	32.9	29.63	.58	4	87.6	24.00	56.7	51.6	40.17	.81	2
40	37.3	32.3	29.64	.57	4	87.7	2441	57.3	52.3	41.15	.82	2
41	36.6	31.7	29.65	.56	4	87.7	2482	58.0	53.0	42.13	.82	2
42	36.0	31.1	29.67	.55	4	87.7	25.24	58.5	53.7	43.11	.83	2
43	35.3	30.5	29.68	.54	4	87.8	25.66	59.1	54.3	44.09	.84	2
44	34.7	30.0	29.69	.53	4	87.8	26.08	59.7	55.0	45.07	.84	2
45	34.1	29.6	29.70	.53	4	87.8	26.50	60.2	55.6	46.06	.85	2
46	33.5	28.9	29.71	.52	4	87.9	26.93	60.8	56.2	47.04	.85	2
47	32.9	28.4	29.72	.51	4	87.9	27.35	61.3	56.8	48.03	.86	2
48	32.3	27.9	29.73	.50	4	87.9	27.78	61.8	57.4	49.01	.86	2
49	31.8	27.4	29.74	.49	4	88.0	28.22	62.3	57.9	49.99	.87	2
50	31.3	27.0	29.75	.49	4	88.0	28.65	62.7	58.4	50.98	.87	2
51	30.7	26.5	29.75	.48	4	88.0	29.09	63.2	58.9	51.96	.87	2
52	30.2	26.1	29.76	.47	4	88.1	29.53	63.6	59.5	52.95	.88	2
53	29.7	25.7	29.77	.46	4	88.1	29.97	64.0	60.0	53.94	.88	2
54	29.3	25.2	29.78	.46	4	88.1	30.41	64.5	60.4	54.92	.89	2
55	28.8	24.9	29.78	.45	4	88.1	30.86	64.9	60.9	55.91	.89	2
56	28.4	24.5	29.79	.45	4	88.2	31.31	65.3	61.3	56.90	.89	2
57	28.0	24.1	29.79	.44	4	88.2	31.75	65.6	61.8	5788	.89	2

28 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
58	27.5	23.7	29.80	.43	4	88.2	32.20	66.0	62.2	58.87	.90	1
59	27.1	23.4	29.81	.43	4	88.2	32.65	66.4	62.6	59.86	.90	1
60	26.8	23.0	29.81	.42	4	88.3	33.11	66.7	63.0	60.85	.90	1
61	26.4	22.7	29.82	.42	4	88.3	33.56	67.0	63.4	61.84	.91	1
62	26.0	22.4	29.82	.41	4	88.3	34.01	67.4	63.7	62.83	.91	1
63	25.6	22.0	29.83	.40	4	88.3	34.47	67.7	64.1	63.81	.91	1
64	25.3	21.8	29.83	.40	4	88.4	34.93	68.0	64.5	64.80	.91	1
65	24.9	21.5	29.84	.39	4	88.4	35.39	68.3	64.8	65.79	.92	1
66	24.6	21.2	29.84	.39	4	88.4	35.85	68.6	65.2	66.78	.92	1
67	24.3	20.9	29.85	.38	4	88.4	36.44	68.9	65.5	67.77	.92	1
68	23.9	20.6	29.85	.38	4	88.4	36.77	69.2	65.8	68.76	.92	1
69	23.6	20.3	29.85	.37	4	88.5	37.23	69.4	66.1	69.75	.92	1
70	23.3	20.1	29.86	.37	4	88.5	37.70	69.7	66.5	70.74	.93	1
71	23.0	19.8	29.86	.36	4	88.5	38.16	70.0	66.8	71.73	.93	1
72	22.7	19.5	29.87	.36	4	88.5	38.63	70.2	67.1	72.72	.93	1
73	22.4	19.3	29.87	.35	4	88.5	39.09	70.5	67.4	73.71	.93	1
74	22.1	19.1	29.87	.35	4	88.5	39.56	70.7	67.6	74.71	.93	1
75	21.9	18.8	29.87	.35	4	88.6	40.03	71.0	67.9	75.70	.93	1
76	21.6	18.6	29.88	.34	4	88.6	40.50	71.2	68.2	76.69	.94	1
77	21.4	18.4	29.88	.34	4	88.6	40.97	71.4	68.4	77.68	.94	1
78	21.1	18.2	29.88	.33	4	88.6	41.44	71.6	68.7	78.67	.94	1
79	20.9	17.9	29.89	.33	4	88.6	41.91	71.9	68.9	79.67	.94	1
80	20.7	17.7	29.89	.33	4	88.6	42.38	72.1	69.2	80.66	.94	1
81	20.4	17.5	29.89	.32	4	88.7	42.85	72.3	69.4	81.65	.94	1
82	20.1	17.3	29.89	.32	4	88.7	43.22	72.5	69.6	82.64	.94	1
83	19.9	17.1	29.90	.32	4	88.7	43.80	72.7	69.9	83.64	.95	1
84	19.7	16.9	29.90	.31	4	88.7	44.27	72.9	70.1	84.63	.95	1
85	19.5	16.8	29.90	.31	4	88.7	44.75	73.1	70.3	85.62	.95	1
86	19.3	16.6	29.90	.31	4	88.7	45.22	73.2	70.5	86.62	.95	1
87	19.0	16.4	29.90	.30	4	88.7	45.70	73.4	70.7	87.61	.95	1

	PINION					PINION AND GEAR		GEAR				
28 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
88	18.9	16.2	29.91	30	4	88.8	46.17	73.6	70.9	88.60	.95	1
89	18.7	16.1	29.91	.30	4	88.8	46.65	73.8	71.2	89.60	.95	1
90	18.5	15.9	29.91	.29	4	88.8	47.13	73.9	71.4	90.59	.95	1
91	18.3	15.7	29.91	.29	4	88.8	47.60	74.1	71.5	91.59	.95	1
92	18.1	15.5	29.91	29	4	88.8	48.08	74.3	71.7	92.58	.95	1
93	17.9	15.4	29.91	.29	4	88.8	48.56	74.4	71.9	93.58	.95	1
94	17.7	15.2	29.92	.28	4	88.8	49.04	74.6	72.1	94.57	.96	1
95	17.5	15.1	29.92	28	4	88.8	49.52	74.8	72.3	95.56	.96	1
96	17.4	15.0	29.92	28	4	88.8	50.00	74.9	72.4	96.56	.96	1
97	17.2	14.8	29.92	.27	4	88.9	50.48	75.0	72.6	97.55	.96	1
98	17.0	14.6	29.92	.27	4	88.9	50.96	75.2	72.8	98.54	.96	1
99	16.9	14.5	29.93	.27	4	88.9	51.44	75.3	73.0	99.54	.96	1
100	16.7	14.4	29.93	.26	4	88.9	51.92	75.5	73.1	100.53	.96	1
101	16.5	14.2	29.93	.26	4	88.9	52.40	75.6	73.3	101.53	.96	1
102	16.4	14.1	29.93	26	4	88.9	52.89	75.7	73.4	102.52	.96	1
103	16.2	14.0	29.93	.26	4	88.9	53.37	75.9	73.6	103.52	.96	1
104	16.1	13.8	29.93	26	4	88.9	53.85	76.0	73.7	104.52	.96	1
105	16.0	13.7	29.93	.25	4	88.9	54.33	76.1	73.9	105.51	.96	1
106	15.8	13.6	29.93	.25	4	88.9	54.82	76.3	74.0	106.51	.96	1
107	15.7	13.5	29.93	.25	4	89.0	55.30	76.4	74.2	107.51	.96	1
108	15.5	13.3	29.94	.25	4	89.0	55.79	76.5	74.3	108.50	.97	1
109	15.4	13.2	29.94	.25	4	89.0	56.27	76.6	74.5	109.50	.97	1
110	15.3	13.1	29.94	.24	4	89.0	56.75	76.7	74.6	110.49	.97	1
111	15.1	13.0	29.94	.24	4	89.0	57.24	76.9	74.7	111.49	.97	1
112	15.0	12.9	29.94	.24	4	89.0	57.72	77.0	74.8	112.49	.97	1
113	14.9	12.8	29.94	.24	4	89.0	58.21	77.1	75.0	113.48	.97	1
114	14.7	12.7	29.94	.24	4	89.0	58.69	77.2	75.1	114.48	.97	1
115	14.6	12.6	29.94	.23	4	89.0	59.18	77.3	75.2	115.47	.97	1
116	14.5	12.5	29.94	.23	4	89.0	59.67	77.4	75.4	116.47	.97	1
117	14.4	12.3	29.94	.23	4	89.0	60.15	77.5	75.5	117.47	.97	1

	PINION					PINION AND GEAR		GEAR				
28 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
118	14.3	12.2	29.95	.23	4	89.0	60.64	77.6	75.6	118.46	.97	1
119	14.1	12.1	29.95	.23	4	89.1	61.12	77.7	75.7	119.46	.97	1
120	14.0	12.0	29.95	.23	4	89.1	61.61	77.8	75.8	120.46	.97	1
121	13.9	12.0	29.95	.22	4	89.1	62.10	77.9	75.9	121.45	.97	1
122	13.8	11.9	29.95	.22	4	89.1	62.59	78.0	76.0	122.45	.97	1
123	13.7	11.8	29.95	.22	4	89.1	63.07	78.1	76.2	123.45	.97	1
124	13.6	11.7	29.95	.22	4	89.1	63.56	78.2	76.3	124.44	.97	1
125	13.5	11.6	29.95	.22	4	89.1	64.05	78.3	76.4	125.44	.97	1
126	13.4	11.5	29.95	.22	4	89.1	64.54	78.4	76.5	126.44	.97	1
127	13.3	11.4	29.95	.21	4	89.1	65.02	78.5	76.6	127.43	.97	1
128	13.2	11.3	29.95	.21	4	89.1	65.51	78.6	76.7	128.43	.97	1
129	13.1	11.2	29.95	.21	4	89.1	66.00	78.6	76.8	129.43	.97	1
130	13.0	11.2	29.95	.21	4	89.1	66.49	78.7	76.9	130.42	.97	1
131	13.9	11.1	29.95	.21	4	89.1	66.98	78.8	77.0	131,42	.97	1
132	13.8	11.0	29.96	.21	4	89.1	67.47	78.9	77.1	132,42	.98	1

	PINION					PINION AND GEAR		GEAR				
29 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
29	47.8	41.8	30.41	.70	3	87.2	20 51					
30	46.8	40.9	30.44	.69	3	87.2	20.86	48.7	42.8	31.39	.72	3
31	45.8	40.0	30 46	.68	3	87.3	21.22	49 6	43.8	32.37	.73	3
32	44.8	39.1	30.48	.67	3	87.3	21.59	50.5	44.7	33.34	.74	3
33	43.9	38.3	30.50	.66	3	87.4	21.97	51 3	45.7	34.32	.75	3
34	33.0	37.5	30.52	.65	3	87.4	2234	52.1	46.6	35.30	.76	3
35	42.2	36.7	30.54	.63	3	87.5	22.73	52.9	47.5	36.27	.77	2
36	41.8	36.0	30.56	62	3	87.5	23.11	53.6	48.3	37.25	.78	2
37	40.5	35.3	30.57	.61	3	87 6	23.50	54.3	49.1	38.23	.78	2
38	39.7	34.6	30.59	.60	3	876	23.90	55.0	49.9	39.21	.79	2
39	39.0	33.9	30.61	.59	3	87.6	2430	55.7	50.7	40.19	.80	2
40	38.2	33.3	30.62	.58	3	87.7	2470	56.4	51.4	41.17	.81	2
41	37.5	32.6	30.64	.57	3	877	25.11	57.0	52.1	42.15	.82	2
42	36.9	32.0	30.65	.57	3	87.7	25.52	57.6	52.8	43.14	.82	2
43	36.2	31.5	30.66	.56	3	87.8	25.93	58.2	53.5	44.12	.83	2
44	35.6	30.9	30.67	55	3	87.8	26.35	58.8	54.1	45.10	.83	2
45	35.0	30.3	30.68	.54	3	87.9	26.77	59.3	54.7	46 08	.84	2
46	34.3	29.8	30.69	.53	3	87.9	27.19	59.9	55.3	47.07	.84	2
47	33.7	29.3	30.70	52	3	87 9	2761	60.4	55.9	48 05	85	2
48	33.2	28.8	30.71	.52	3	88.0	28.04	60.9	56.5	49.04	.85	2
49	32.6	28.3	30.72	51	3	88 0	28.47	61.4	57 0	50 02	.86	2
50	32.1	27.8	30.73	50	4	88.0	28.90	61.9	57.6	51.01	.86	2
51	31.6	27.4	30.74	.49	4	88.0	29.33	62.3	58.1	51.99	.87	2
52	31.1	26.9	30.75	.49	4	88.1	29.77	62.8	58.6	52.98	87	2
53	30.6	26.5	30.76	.48	4	88.1	30.21	63.2	59.1	53.96	.88	2
54	30.1	26.1	30.76	.47	4	88.1	30.65	63.6	59.6	54.95	.88	2
55	29.6	25.7	30.77	.46	4	88.2	31.09	64.0	60.1	55.93	.88	2
56	29.2	25.3	30.78	.46	4	88.2	31.53	64.4	60.6	56.92	.89	2
57	28.8	24.9	30.78	.45	4	88.2	31.98	64.8	61.0	57.91	.89	2
58	28.3	24.5	30.79	.45	4	88.2	32.42	65.2	61.4	58.90	.89	2

29 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
59	27.9	24.3	30.79	.44	4	88.3	32.87	65.6	61.8	59.88	.89	1
60	27.5	23.8	30.80	.43	4	88.3	33.37	65.9	62.2	60.87	.90	1
61	27.1	23.5	30.81	.43	4	88.3	33.77	66.3	62.6	61.86	.90	1
62	26.7	23.1	30.81	.42	4	88.3	34.22	66.6	63.0	62.85	.90	1
63	26.4	22.8	30.82	.42	4	88.3	3468	66.9	63.4	63.84	.91	1
64	26.0	22.5	30.82	.41	4	88.4	35.13	67.3	63.7	64.83	.91	1
65	25.7	22.2	30.83	.41	4	88.4	35.59	67.6	64.1	65.82	.91	1
66	25.3	21.9	30.83	.40	4	88.4	36.04	67.9	64.5	66.81	.91	1
67	25.0	21.6	30.84	.40	4	88.4	36.50	68.2	64.8	67.80	.92	1
68	24.6	21.3	30.84	.39	4	88.4	36.96	68.4	65.1	68.79	.92	1
69	24.3	21.0	30.84	.39	4	88.5	37.42	68.7	65.4	69.78	.92	1
70	23.9	20.7	30.85	.38	4	88.5	37.88	69.0	65.8	70.77	.92	1
71	23.6	20,5	30.86	.38	4	88.5	38.35	69.3	66.1	71.76	.93	1
72	23.3	20.2	30.86	.37	4	88.5	38.81	69.5	66.4	72.75	.93	1
73	23.0	20.0	30.86	.37	4	88.5	39.27	69.8	66.7	73.74	.93	1
74	22.8	19.7	30.87	.36	4	88.6	39.74	70.1	67.0	74.73	.93	1
75	22.5	19.5	30.87	.36	4	88.6	40.20	70.3	67.3	75.72	.93	1
76	22.2	19.2	30.87	.35	4	88.6	40.67	70.6	67.6	76.71	.93	1
77	21.9	19.0	30.88	.35	4	88.6	41.14	70.8	67.8	77.70	.94	1
78	21.7	18.8	30.88	.35	4	88.6	41.61	71.0	68.1	78.70	.94	1
79	21.4	18.6	30.88	.34	4	88.6	42.08	71.2	68.3	79.69	.94	1
80	21.2	18.3	30.88	.34	4	88.6	42.55	71.4	68.6	80.68	.94	1
81	21.0	18.1	30.89	.33	4	88.7	43.02	71.7	68.8	81.67	.94	1
82	20.7	17.9	30.89	.33	4	88.7	4349	71.9	69.1	82.67	.94	1
83	20.5	17.7	30.89	.33	4	88.7	43.96	72.1	69.3	83.66	.94	1
84	20.3	17.5	30.89	.32	4	88.7	4443	72.3	69.5	84.65	.94	1
85	20.0	17.3	30.89	.32	4	88.7	4490	72.5	69.7	85.64	.94	1
86	19.8	17.2	30.90	.32	4	88.7	45.38	72.7	70.0	86.64	.95	1
87	19.6	17.0	30.90	.31	4	88.7	45.85	72.9	70.2	87.63	.95	1
88	19.4	16.8	30.90	.31	4	88.8	46.33	73.0	70.4	88.62	.95	1

	PINION					PINION AND GEAR		GEAR				
29 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
89	19.2	16.6	30.90	.31	4	88.8	46.80	73.2	70.6	89.62	.95	1
90	19.0	16.5	30.90	.30	4	88.8	47.28	73.4	70.8	90.61	.95	1
91	18.8	16.3	30.91	.30	4	88.8	47.75	73.6	71.0	91.61	.95	1
92	18.6	16.1	30.91	.30	4	88.8	48.23	73.7	71.2	92.60	.95	1
93	18.4	16.0	30.91	.29	4	88.8	48.71	73.9	71.4	93.59	.95	1
94	18.2	15.8	30.91	.29	4	88.8	49.19	74.0	71.6	94.59	.95	1
95	18.0	15.6	30.91	.29	4	88.8	49.66	74.2	71.7	95.58	.95	1
96	17.9	15.5	30.91	.29	4	88.9	50.14	74.4	71.9	96.58	.95	1
97	17.7	15.3	30.92	.28	4	88.9	50.62	74.5	72.1	97.57	.96	1
98	17.5	15.2	30.92	.28	4	88.9	51.10	74.7	72.3	98.57	.96	1
99	17.4	15.0	30.92	.28	4	88.9	51.58	74.8	72.4	99.56	.96	1
100	17.2	14.9	30.92	.28	4	88.9	52.06	75.0	72.6	100.56	.96	1
101	17.0	14.8	30.92	.27	4	88.9	52.54	75.1	72.8	101.55	.96	1
102	16.9	14.6	30.92	.27	4	88.9	53.02	75.2	72.9	102.55	.96	1
103	16.7	14.5	30.92	.27	4	88.9	53.50	75.4	73.1	103.54	.96	1
104	16.6	14.3	30.93	.27	4	88.9	53.98	75.5	73.3	104.54	.96	1
105	16.4	14.2	30.93	.26	4	88.9	54.46	75.6	73.4	105.53	.96	1
106	16.3	14.1	30.93	.26	4	89.0	54.95	75.8	73.5	106.53	.96	1
107	16.1	14.0	30.93	.26	4	89.0	55.43	75.9	73.7	107.52	.96	1
108	16.0	13.8	30.93	.26	4	89.0	55.91	76.0	73.8	108.52	.96	1
109	15.9	13.7	30.93	.26	4	89.0	56.40	76.1	74.0	109.51	.96	1
110	15.7	13.6	30.93	.25	4	89.0	56.88	76.3	74.1	110.51	.96	1
111	15.6	13.5	30.93	.25	4	89.0	57.36	76.4	74.3	111.51	.96	1
112	15.4	13.3	30.94	.25	4	89.0	57.85	76.5	74.4	112.50	.97	1
113	15.3	13.2	30.94	.25	4	89.0	58.33	76.6	74.5	113.50	.97	1
114	15.2	13.1	30.94	.24	4	89.0	58.82	76.7	74.6	114.49	.97	1
115	15.0	13.0	30.94	.24	4	89.0	59.30	76.9	74.8	115.49	.97	1
116	14.9	12.9	30.94	.24	4	89.0	59.78	77.0	74.9	116.49	.97	1
117	14.8	12.8	30.94	.24	4	89.0	60.27	77.1	75.0	117.48	.97	1
118	14.7	12.7	30.94	.24	4	89.0	60.76	77.2	75.1	118.48	.97	1

29 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
119	14.6	12.6	30.94	.23	4	89.1	61.24	77.3	75.3	119.40	.97	1
120	14.5	12.5	30.94	.23	4	89.1	61.73	77.4	75.4	120.47	.97	1
121	14.3	12.4	30.94	.23	4	89.1	62.21	77.5	75.5	121.47	.97	1
122	14.2	12.3	30.95	.23	4	89.1	62.70	77.6	75.6	122.46	.97	1
123	14.1	12.2	30.95	.23	4	89.1	63.18	77.7	75.7	123.46	.97	1
124	14.0	12.1	30.95	.23	4	89.1	63.67	77.8	75.9	124.46	.97	1
125	13.9	12.0	30.95	.22	4	89.1	64.16	77.9	76.0	125.45	.97	1
126	13.8	11.9	30.95	.22	4	89.1	64.65	78.0	76.1	126.45	.97	1
127	13.7	11.8	30.95	.22	4	89.1	65.13	78.1	76.2	127.45	.97	1
128	13.6	11.7	30.95	.22	4	89.1	65.62	78.1	76.3	128.44	.97	1
129	13.5	11.6	30.95	.22	4	89.1	66.11	78.2	76.4	129.44	.97	1
130	13.4	11.6	30.95	.22	4	89.1	66.60	78.3	76.5	130.44	.97	1
131	13.3	11.5	30.95	.21	4	89.1	67.08	78.4	76.6	131.43	.97	1
132	13.2	11.4	30.95	.21	4	89.1	67.58	78.5	76.7	132.43	.97	1

30 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
30	47.7	41.9	31.41	.70	3	87.3	21.21					
31	46.7	41.0	31.44	.69	3	87.3	21.57	48.6	42.9	32.39	.72	3
32	45.7	40.1	31.46	.68	3	87.4	21.93	49.5	43.9	33.37	.73	3
33	44.8	39.3	31.48	.67	3	87.4	22.30	50.3	44.8	34.34	.74	3
34	43.9	38.5	31.50	.66	3	87.5	22.67	51.1	45.7	35.33	.75	3
35	43.1	37.7	31.52	.65	3	87.5	23.05	51.9	46.6	36.30	.76	3
36	42.2	37.0	31.54	.64	3	87.6	23.43	52.6	47.4	37.28	.77	2
37	41.4	36.3	31.55	.63	3	87.6	23.82	53.4	48.2	38.26	.77	2
38	40.6	35.5	31.57	.62	3	87.6	24.21	54.1	49.0	39.24	.78	2
39	39.9	34.9	31.59	.61	3	87.7	24.60	54.7	49.8	40.22	.79	2
40	39.1	34.2	31.60	.60	3	87.7	25.00	55.4	50.5	41.20	.80	2
41	38.4	33.6	31.62	.59	3	87.7	25.40	56.1	51.2	42.18	.81	2
42	37.7	33.0	31.63	.58	3	87.8	25.81	56.7	51.9	43.16	.81	2
43	37.1	32.4	31.64	.57	3	87.8	26.21	57.3	52.6	44.14	.82	2
44	36.4	31.8	31.65	.56	3	87.8	26.63	57.9	53.2	45.13	.82	2
45	35.8	31.3	31.67	.55	3	87.9	27.04	58.4	53.9	46.11	.83	2
46	35.2	30.7	31.68	.54	3	87.9	27.46	59.0	54.5	47.09	.84	2
47	34.6	30.2	31.69	.54	3	87.9	27.88	59.5	55.1	48.08	.84	2
48	34.0	29.7	31.70	.53	3	88.0	28.30	60.0	55.7	49.06	.85	2
49	33.5	29.2	31.71	.52	3	88.0	28.73	60.5	56.2	50.05	.85	2
50	32.9	28.7	31.72	.51	3	88.0	29.15	61.0	56.8	51.03	.86	2
51	32.4	28.2	31.72	.51	3	88.1	29.58	61.5	57.3	52.02	.86	2
52	31.9	27.7	31.73	.50	4	88.1	30.02	62.0	57.9	53.00	.86	2
53	31.4	27.3	31.74	.49	4	88.1	30.45	62.4	58.3	53.99	.87	2
54	30.9	26.9	31.75	.48	4	88.1	30.89	62.8	58.8	54.97	.87	2
55	30.4	26.5	31.76	.48	4	88.2	31.32	63.2	59.3	55.96	.88	2
56	30.0	26.1	31.76	.47	4	88.2	31.76	63.6	59.8	56.95	.88	2
57	29.5	25.7	31.77	.46	4	88.2	32.21	64.0	60.2	57.93	.88	2
58	29.1	25.3	31.78	.46	4	88.2	32.65	64.4	60.6	58.92	.89	2
59	28.7	25.0	31.78	.45	4	88.3	33.09	64.8	61.1	59.91	.89	2

30 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
60	28.2	24.6	31.79	.45	4	88.3	33.54	65.2	61.5	60.90	.89	2
61	27.9	24.2	31.79	.44	4	88.3	33.99	65.5	61.9	61.88	.89	1
62	27.5	23.9	31.80	.43	4	88.3	34.44	65.9	62.3	62.87	.90	1
63	27.1	23.6	31.81	.43	4	88.4	34.89	66.2	62.7	63.86	.90	1
64	26.7	23.2	31.81	.42	4	88.4	35.34	66.5	63.0	64.85	.90	1
65	26.4	22.9	31.82	.42	4	88.4	35.79	66.8	63.4	65.84	.91	1
66	26.0	22.6	31.82	.41	4	88.4	36.25	67.1	63.8	66.83	.91	1
67	25.7	22.3	31.83	.41	4	88.4	36.70	67.5	64.1	67.82	.91	1
68	25.3	22.0	31.83	.40	4	88.5	37.16	67.8	64.4	68.81	.91	1
69	25.0	21.7	31.84	.40	4	88.5	37.62	68.0	64.8	69.80	.92	1
70	24.7	21.5	31.84	.39	4	88.5	38.08	68.3	65.1	70.79	.92	1
71	24.3	21.2	31.84	.39	4	88.5	38.54	68.5	65.4	71.78	.92	1
72	24.0	20.9	31.85	.38	4	88.5	39.00	68.8	65.7	72.77	.92	1
73	23.7	20.7	31.85	.38	4	88.5	39.46	69.1	66.0	73.76	.92	1
74	23.4	20.4	31.85	.37	4	88.6	3992	69.4	66.3	7475	.92	1
75	23.1	20.2	31.86	.37	4	88.6	4039	69.6	66.6	75.74	.93	1
76	22.9	19.9	31.86	.36	4	88.6	4085	69.9	66.9	76.73	.93	1
77	22.6	19.7	31.86	.36	4	88.6	41.32	70.1	67.2	7773	.93	1
78	22.4	19.5	31.87	.36	4	88.6	41.79	70.3	67.4	78.72	93	1
79	22.1	19.2	31.87	.35	4	88.6	42.25	70.6	67.7	79.71	93	1
80	21.9	19.0	31.87	.35	4	88.7	4272	70.8	67.9	80.70	93	1
81	21.6	18.8	31.88	.34	4	88.7	43.19	71.0	68.2	81.69	.94	1
82	21.4	18.6	31.88	.34	4	88.7	43.66	71.2	68.4	82,69	.94	1
83	21.1	18.4	31.88	.34	4	88.7	44.13	71.4	68.7	83.68	94	1
84	20.9	18.2	31.88	.33	4	88.7	44.60	71.6	68.9	84.67	94	1
85	20.7	18.0	31.89	.33	4	88.7	45.07	71.8	69.1	85.66	94	1
86	20.4	17.8	31.89	.33	4	88.7	45.54	72.0	69.4	86.66	.94	1
87	20.2	17.6	31.89	.32	4	88.8	46.01	72.2	69.6	87.65	.94	1
88	20.0	17.4	31.89	.32	4	88.8	46.49	72.4	69.8	88.64	.94	1
89	19.8	17.2	31.90	.32	4	88.8	46.96	72.6	70.0	89.64	.95	1

30 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
90	19.6	17 0	31.90	.31	4	88.8	47.43	72 8	70.2	90.63	.95	1
91	19.4	16.8	31.90	.31	4	88.8	47.91	73.0	70 4	91.63	95	1
92	19.2	16 7	31.90	.31	4	88 8	48.38	73.2	70.6	92 62	.95	1
93	19.0	16.5	31.90	.30	4	88 8	4886	73 3	70.8	93.61	.95	1
94	18.8	16.3	31.90	30	4	88.8	49.34	73.5	71.0	94.61	.95	1
95	18.6	16.2	31.91	.30	4	88.8	49.81	73.7	71.2	95 61	.95	1
96	18.4	16.0	31.91	.30	4	88.9	50.29	73.8	71.4	96.60	.95	1
97	18.2	15.9	31.91	.29	4	88.9	50.76	74.0	71.6	97.59	.95	1
98	18.1	15.7	31.91	:29	4	88.9	51.24	74.1	71.7	98.58	95	1
99	17.9	15.6	3191	.29	4	88.9	51.72	74.3	71.9	99.58	.95	1
100	17.7	15.4	31.91	.28	4	88.9	52.20	74.4	72.1	100.57	.95	1
101	17.6	15.3	31.92	.28	4	88.9	52.68	74.6	72.3	101.57	.96	1
102	17.4	15.1	31.92	.28	4	88.9	53.16	74 6	72 4	102 56	96	1
103	17.3	15.0	31.92	.28	4	88.9	53.64	74.8	72.6	103 56	96	1
104	17.1	14.9	31.92	.28	4	88.9	54.12	75.0	72.7	104.56	96	1
105	16.9	14.7	31.92	.27	4	88.9	54.60	75.1	72.9	105.55	.96	1
106	16 8	14 6	31.92	.27	4	89.0	55.08	75.2	73.0	106.54	.96	1
107	16 6	14.5	31.92	.27	4	89.0	55.56	75.4	73.2	107 54	.96	1
108	16 5	14 3	31.93	.27	4	89.0	56.04	75.5	73.4	108.54	.96	1
109	16.4	14 2	31.93	.26	4	89.0	56.52	75.6	73.5	109.53	.96	1
110	16.2	14.1	31.93	.26	4	89.0	57.01	75.8	73.6	110.53	.96	1
111	16.1	14.0	31 93	.26	4	89 0	57.49	75.9	73.8	111.52	96	1
112	15.9	13.8	31.93	.26	4	89 0	57.97	76.0	73 9	112 52	.96	1
113	15.8	13 7	31.93	.25	4	89.0	58.46	76.1	74.1	113.51	.96	1
114	15.7	13 6	31.93	25	4	89.0	58.94	76.2	74.2	114.51	.96	1
115	15.5	13 5	31.93	.25	4	89 0	59.42	76 4	74.3	115 51	.96	1
116	15.4	13 4	31 94	.25	4	89 0	59.91	76.5	74 5	116.50	.97	1
117	15 3	13.3	31.94	.25	4	89.0	60.39	76.6	74.6	117 50	97	1
118	15.2	13 2	31.94	.24	4	89.1	60.88	76.7	74.7	118.49	97	1
119	15 0	13.0	31 94	.24	4	89.1	61.36	76.8	74.8	119 49	.97	1

30 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
120	14.9	12.9	31.94	.24	4	89.1	61.85	76.9	74.9	120.49	.97	1
121	14.8	12.8	31.94	.24	4	89.1	62.33	77.0	75.0	121.48	.97	1
122	14.7	12.7	31.94	.24	4	89.1	62.82	77.1	75.2	122.48	.97	1
123	14.6	12.6	31.94	.24	4	89.1	63.30	77.2	75.3	123.48	.97	1
124	14.4	12.5	31.94	.23	4	89.1	63.79	77.3	75.4	124.47	.97	1
125	14.3	12.4	31.94	.23	4	89.1	64.27	77.4	75.5	125.47	.97	1
126	14.2	12.3	31.95	.23	4	89.1	64.76	77.5	75.6	126.46	.97	1
127	14.1	12.3	31.95	.23	4	89.1	65.25	77.6	75.7	127.46	.97	1
128	14.0	12.2	31.95	.23	4	89.1	65.74	77.7	75.8	128.46	.97	1
129	13.9	12.1	31.95	.23	4	89.1	66.22	77.8	76.0	129.46	.97	1
130	13.8	12.0	31.95	.22	4	89.1	66.71	78.0	76.1	130.45	.97	1
131	13.7	11.9	31.95	.22	4	89.1	67.20	78.0	76.2	131.45	.97	1
132	13.6	11.8	31.95	.22	4	89.1	67.68	78.1	76.3	132.45	.97	1

31 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
31	47.6	42.0	32 41	.70	3	87 4	21.92					
32	46.7	41.1	32 44	.69	3	87 4	22.28	48.5	43.0	33.39	.72	3
33	45.7	40.3	32 46	68	3	87 5	22.64	49.3	43.9	34.37	.73	3
34	44.8	39.5	32 48	.67	3	87 5	23.00	50.1	44.8	35 35	.74	3
35	44 0	38.7	32 50	.66	3	87.5	23 38	50.9	45.7	36.32	.75	3
36	43.1	38 0	32.52	.65	3	87.6	23.75	51.7	46.5	37.30	.76	2
37	42 3	37 2	32.53	.64	3	87.6	24.13	52 4	47.3	38.28	.76	2
38	41.5	36.5	32.55	.63	3	87.7	24.52	53.1	48.1	39.26	.77	2
39	40.8	35.8	32 57	.62	3	87.7	24.91	53 8	48.9	40.24	78	2
40	40.0	35.1	32 58	61	3	87.7	25.30	54 5	49 6	41.22	.79	2
41	39.3	34 5	32 60	60	3	87 8	25.70	55.1	50 3	42.21	80	2
42	38.6	33.9	32 61	.59	3	87 8	26.10	55.8	51.1	43.19	80	2
43	38.0	33.3	32 62	.58	3	87.8	26.50	56.4	51.7	44.17	.81	2
44	37.3	32.7	32 64	57	3	87 9	26.91	57 0	52 4	45.15	.82	2
45	36.6	32.1	32 65	56	3	87 9	27.32	57.5	53 0	46.13	.82	2
46	36.0	31.6	32 66	.56	3	87 9	27.73	58 1	53 6	47.12	.83	2
47	35.5	31 1	32 67	56	3	88.0	28.15	58.6	54.2	48.12	.83	2
48	34.9	30.5	32.68	.54	3	88.0	28.57	59.1	54.8	49.09	.84	2
49	34.3	30.0	32 69	.53	3	88.0	28.99	59.6	55.4	50 07	.84	2
50	33.7	29.5	32 70	.52	3	88.0	29.41	60.1	56.0	51.05	.85	2
51	33.2	29.1	32 71	.52	3	88.1	29.84	60.6	56 5	52.04	.85	2
52	32.7	28 6	32 72	.51	3	88.1	30.27	61.1	57.0	53.03	.86	2
53	32.2	28.2	32.73	.50	3	88.1	30.70	61.5	57 5	54.01	.86	2
54	31.7	27.7	32 74	.50	3	88.2	31.13	62.0	58 0	55.00	.87	2
55	31.2	27.3	32 74	49	3	88.2	31.57	62.4	58.5	55.98	.87	2
56	30.8	26.9	32 75	48	3	88.2	32.00	62 8	59.0	56.97	87	2
57	30.3	26.5	32 76	48	3	88.2	32.44	63.2	59.4	57.96	.88	2
58	29.8	26.1	32.76	.47	3	88 3	32.88	63.6	59.9	58.94	88	2
59	29.4	25.7	32.77	46	3	88 3	33.32	64.0	60.3	59.93	88	2
60	29.0	25.4	32.78	.46	3	88.3	33.77	64.4	60.7	60.92	.89	2

31 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
61	28.6	25.0	32.78	.45	3	88.3	34.21	64.7	61.1	61.91	.89	1
62	28.2	24.6	32.79	.45	4	88.3	34.66	65.1	61.5	62.90	.89	1
63	27.8	24.3	32.79	.44	4	88.4	35.11	65.4	61.9	63.88	.89	1
64	27.4	24.0	32.80	.43	4	88.4	35.56	65.8	62.3	64.87	.90	1
65	27.1	23.7	32.81	.43	4	88.4	36.01	66.1	62.7	65.86	90	1
66	26.7	23.3	32.81	.42	4	88.4	36.46	66.4	63.0	66.85	.90	1
67	26.4	23.0	32.82	.42	4	88.4	36.91	66.7	63.4	67.84	.91	1
68	26.0	22.7	32.82	.41	4	88.5	37.37	67.0	63.7	68.83	.91	1
69	25.7	22.4	32.83	.41	4	88.5	37.82	67.3	64.1	69.82	.91	1
70	25.3	22.2	32.83	.40	4	88.5	38.28	67.6	64.4	70.81	.91	1
71	25.0	21.9	32.83	.40	4	88.5	38.74	67.9	64.8	71.80	.91	1
72	24.7	21.6	32.84	.39	4	88.5	39.20	68.2	65.1	72.79	.92	1
73	24.4	21.4	32.84	.39	4	88.6	39.65	68.4	65.4	73.78	.92	1
74	24.1	21.1	32.85	.38	4	88.6	40.11	68.7	65.7	74.77	.92	1
75	23.8	20.8	32.85	.38	4	88.6	40.58	69.0	66.0	75.76	.92	1
76	23.5	20.6	32.85	.37	4	88.6	41.04	69.2	66.2	76.75	.92	1
77	23.2	20.4	32.86	.37	4	88.6	41.50	69.5	66.5	77.75	.93	1
78	23.0	20.1	32.86	.37	4	88.6	41.97	69.7	66.8	78.74	.93	1
79	22.7	19.9	32.86	.36	4	88.6	42.43	69.9	67.1	79.73	.93	1
80	22.5	19.6	32.87	.36	4	88.7	42.90	70.1	67.3	80.72	.93	1
81	22.2	19.4	32.87	.35	4	88.7	43.36	70.4	67.6	81.71	.93	1
82	22.0	19.2	32.87	.35	4	88.7	43.83	70.6	67.8	82.71	.93	1
83	21.7	19.0	32.87	.35	4	88.7	44.30	70.8	68.1	83.70	.93	1
84	21.5	18.8	32.88	.34	4	88.7	44.77	71.0	68.3	84.69	.94	1
85	21.3	18.6	32.88	.34	4	88.7	45.24	71.2	68.5	85.68	.94	1
86	21.0	18.4	32.88	.34	4	88.7	45.71	71.4	68.8	86.68	.94	1
87	20.8	18.2	32.88	.33	4	88.8	46.18	71.6	69.0	87.67	.94	1
88	20.6	18.0	32.89	.33	4	88.8	46.65	71.8	69.2	88.66	.94	1
89	20.4	17.8	32.89	.33	4	88.8	47.12	72.0	69.4	89.66	.94	1
90	20.2	17.6	32.89	.32	4	88.8	47.59	72.2	69.6	90.65	.94	1

	PINION					PINION AND GEAR		GEAR				
31 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
91	20.0	17.4	32.89	.32	4	88.8	48.07	72.4	69.9	91.64	.94	1
92	19.8	17.3	32.90	.32	4	88.8	48.54	72.6	70.1	92.64	.95	1
93	19.6	17.1	32.90	.31	4	88.8	49.01	72.7	70.3	93.63	.95	1
94	19.4	16.9	32.90	.31	4	88.8	49.49	72.9	70.5	94.62	.95	1
95	19.2	16.7	32.90	31	4	88.9	49.97	73.1	70.7	95.62	.95	1
96	19.0	16.6	32.90	.30	4	88.9	50.44	73.2	70.8	96.61	.95	1
97	18.8	16.4	32.90	.30	4	88.9	50.92	73.4	71.0	97.61	.95	1
98	18.6	16 3	32.91	.30	4	88.9	51.39	73 6	71.2	98.60	95	1
99	18.4	16.1	32.91	.30	4	88.9	5187	73.7	71.4	99.60	.95	1
100	18.3	16.0	32.91	.29	4	88.9	52 35	73.9	71.5	100.59	95	1
101	18.1	15.8	32.91	.29	4	88.9	52.82	74.0	71.7	101.59	.95	1
102	17.9	15.7	32.91	29	4	88.9	53.30	74.2	71.9	102 58	.95	1
103	17.7	15.5	32.91	.29	4	88.9	53.78	74.3	72.1	103 58	.95	1
104	17.6	15.4	32.91	.28	4	88.9	54.26	74.5	72.2	104.57	.95	1
105	17.4	15.2	32.92	.28	4	88.9	54.74	74.6	72.4	105.57	.96	1
106	17.3	15.1	32.92	.28	4	89.0	55.22	74.8	72.5	106.56	.96	1
107	17.1	15.0	32.92	.28	4	89.0	55.70	749	72.7	107.56	.96	1
108	17.0	14.8	32.92	.27	4	89.0	56.18	75.0	72.9	108.55	.96	1
109	16.9	14.7	32 92	.27	4	89.0	56 66	75.1	73.0	109.55	.96	1
110	16.7	14.6	32 92	.27	4	89.0	57.14	75.3	73.1	110.54	.96	1
111	16.5	14.5	32.93	.27	4	89.0	57.62	75.4	73.3	111.54	.96	1
112	16.4	14.3	32.93	.26	4	89.0	58.11	75.5	73.4	112.53	.96	1
113	16.3	14.2	32.93	.26	4	89.0	58.59	75.7	73.6	113.53	.96	1
114	16.1	14.1	32.93	.26	4	89 0	59.07	75.8	73.7	114.52	.96	1
115	16.0	14.0	32.93	.26	4	89.0	59.55	75.9	73.9	115.52	.96	1
116	15.9	13.8	32.93	.26	4	89 0	60.03	76.0	74 0	116.52	.96	1
117	15.7	13.7	32.93	.25	4	89.1	60.52	76.1	74.1	117.51	.96	1
118	15.6	13.6	32.93	.25	4	89.1	61.00	76.2	74.2	118.51	.96	1
119	15.5	13.5	32.93	.25	4	89.1	61.48	76.4	74.4	119.50	.96	1
120	15.4	13.4	32.94	.25	4	89.1	61.97	76.5	74.5	120.50	.97	1

31 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
121	15.2	13.3	32.94	.25	4	89.1	62.45	76.6	74.6	121.50	.97	1
122	15.1	13.2	32.94	.24	4	89.1	62.99	76.7	74.7	122.49	.97	1
123	15.0	13.1	32.94	.24	4	89.1	63.42	76.8	74.9	123.49	.97	1
124	14.9	13.0	32.94	.24	4	89.1	63.91	76.9	75.0	124.49	.97	1
125	14.8	12.9	32.94	.24	4	89.1	64.39	77.0	75.1	125.48	.97	1
126	14.7	12.8	32.94	.24	4	89.1	64.88	77.1	75.2	126.48	.97	1
127	14.5	12.7	32.94	.24	4	89.1	6536	77.2	75.3	127.48	.97	1
128	14.4	12.6	32.94	.23	4	89.1	65.85	77.3	75.4	128.47	.97	1
129	14.3	12.5	32.94	.23	4	89.1	66 34	77.4	75.5	129.47	.97	1
130	14.2	12.4	32.95	.23	4	89.1	66.82	77.5	75.6	130.46	.97	1
131	14.1	12.3	32.95	.23	4	89.1	67.31	77.6	75.8	131.46	.97	1
132	14.0	12.2	32.95	.23	4	89.2	6780	77.7	75.9	132.46	.97	1

	PINION					PINION AND GEAR		GEAR				
32 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
32	47.5	42.1	33.41	.70	3	87.5	22.63					
33	46.6	41.3	33.44	.69	3	87.5	22.98	48.3	43.0	34.39	.72	3
34	45.7	40.4	33.46	.68	3	87.5	23.35	49.2	43.9	35.37	.73	3
35	44.9	39.7	33.48	.67	3	87.6	23.71	50.0	44.8	36.35	.74	3
36	44.0	38.9	33.50	.66	3	87.6	24.08	50.7	45.6	37.33	.75	3
37	43.2	38.2	33.51	.65	3	87.7	24.46	51.5	46.4	38.31	.75	2
38	42.4	37.5	33.53	.64	3	87.7	24.84	52.2	47.2	39.29	.76	2
39	41.6	36.8	33.55	.63	3	87.7	25.22	52.9	48.0	40.27	.77	2
40	40.9	36.1	33.56	.62	3	87.8	25.61	53.6	48.7	41.25	.78	2
41	40.2	35.4	33.58	.61	3	87.8	26.00	54.2	49.5	42.23	.79	2
42	39.5	34.8	33.59	.60	3	87.8	26.40	54.8	50.2	43.21	.79	2
43	38.8	34.5	33.61	.59	3	87.9	26.80	55.5	50.9	44.19	.80	2
44	38.1	34.0	33.62	.58	3	87.9	27.20	56.1	51.5	45.17	.81	2
45	37.5	33.4	33.63	.58	3	87.9	27.61	56.6	52.2	46.16	.81	2
46	36.9	32.5	33.64	.57	3	88.0	28.02	57.2	52.8	47.14	.82	2
47	36.3	31.9	33.65	.56	3	88.0	28.43	57.7	53.4	48.13	.82	2
48	35.7	31.4	33.67	.55	3	88.0	28.67	58.3	54.0	49.11	.83	2
49	35.1	30.9	33.68	.54	3	88.0	29.26	58.8	54.6	50.09	.84	2
50	34.5	30.4	33.69	.54	3	88.1	29.68	59.3	55.2	51.08	.84	2
51	34.0	29.9	33.70	.53	3	88.1	30.10	59.8	55.7	52.06	.85	2
52	33.5	29.4	33.70	.52	3	88.1	30.53	60.3	56.2	53.05	.85	2
53	33.0	29.0	33.71	.52	3	88.1	30.96	60.7	56.7	54.04	.85	2
54	32.5	28.5	33.72	.51	3	88.2	31.38	61.2	57.2	55.02	.86	2
55	32.0	28.1	33.73	.50	3	88.2	31.81	61.6	57.7	56.01	.86	2
56	31.5	27.7	33.74	.49	3	88.2	32.22	62.0	58.2	56.99	.87	2
57	31.1	27.3	33.74	.49	3	88.2	32.68	62.4	58.7	57.98	.87	2
58	30.6	26.9	33.75	.48	3	88.3	33.12	62.8	59.1	58.97	.87	2
59	30.2	26.5	33.76	.47	3	88.3	33.56	63.2	59.5	59.95	.88	2
60	29.7	26.1	33.77	.47	3	88.3	34.00	63.6	60.0	60.94	.88	2
61	29.3	25.8	33.77	.46	3	88.3	34.44	64.0	60.4	61.93	.88	2

	PINION					PINION AND GEAR		GEAR				
32 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
62	28.9	25.4	33.78	.46	3	88.4	34.89	64 3	60.8	62.92	.89	1
63	28.5	25.0	33.78	.45	3	88.4	35 33	64.7	61.2	63.91	.89	1
64	28.1	24.7	33.79	.45	3	88.4	35.78	65.0	61.6	64.90	.89	1
65	27.8	24.4	33.79	.44	3	88.4	36.22	65.4	62.0	65.89	.89	1
66	27.4	24.0	33.80	.43	3	88.4	36.67	65.7	62.4	66.87	.90	1
67	27.0	23.7	33.81	.43	3	88.5	37.12	66.0	62.7	67.86	.90	1
68	26.7	23.4	33.81	.42	3	88.5	37.58	66.3	63.1	68.85	.90	1
69	26.4	23.1	33.82	.42	3	88.5	38.03	66.6	63.4	69.84	.91	1
70	26.0	22.9	33.82	.41	3	88.5	38.48	66.9	63.8	70.83	.91	1
71	25.7	22.6	33.82	.41	3	88.5	38.94	67.2	64.1	71.82	.91	1
72	25.4	22.3	33.83	.40	3	88.5	39.40	67.5	64.4	72.81	.91	1
73	25.1	22.0	33.83	.40	3	88.6	39.85	67.7	64.7	73.80	.91	1
74	24.8	21.8	33.84	.40	3	88.6	40.31	68.0	65.0	74.80	.92	1
75	24.5	21.5	33.84	.39	3	88.6	40.77	68.3	65.3	75.79	.92	1
76	24.2	21.3	33.84	.39	4	88.6	41.23	68.5	65.6	76.78	.92	1
77	23.9	21.0	33.85	.38	4	88.6	41.69	68.8	65.9	77.77	.92	1
78	23.6	20.8	33.85	38	4	88.6	42.15	69 0	66.2	78.76	.92	1
79	23.3	20.5	33.85	.37	4	88.7	42.62	69.3	66.5	79.75	.92	1
80	23.1	20.3	33.86	.37	4	88.7	43.08	69.5	66.7	80.74	.93	1
81	22 8	20.0	33.86	.36	4	88.7	43.55	69.7	67.0	81.73	.93	1
82	22.6	19.8	33.86	.36	4	88.7	44.01	70.0	67.2	82.73	.93	1
83	22 3	19.6	33.87	.36	4	88.7	44.48	70.2	67.5	83.72	.93	1
84	22.1	19.4	33.87	.35	4	88.7	44.94	70.4	67.7	84.71	.93	1
85	21.9	19.2	33.87	.35	4	88.7	45.41	70.6	68.0	85.70	.93	1
86	21.6	19.0	33.87	.35	4	88.7	45.88	70.8	68.2	86.70	.93	1
87	21.4	18.8	33 88	.34	4	88.8	46.35	71.0	68.4	87.69	.94	1
88	21.2	18.6	33.88	.34	4	88.8	46.82	71.2	68.6	88.68	.94	1
89	20.9	18.4	33.88	.34	4	88.8	47.29	71.4	68.9	89.68	.94	1
90	20.7	18.2	33.88	.33	4	88.8	47.76	71.6	69.1	90.67	.94	1
91	20.5	18.0	33.89	.33	4	88.8	48.23	71.8	69.3	91.66	.94	1

32 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
92	20.3	17.8	33.89	.33	4	88.8	48.70	72.0	69.5	92.66	.94	1
93	20.1	17.6	33.89	.32	4	88.8	49.17	72.2	69.7	93.65	.94	1
94	19.9	17.5	33.89	.32	4	88.8	49.65	72.4	69.9	94.64	.94	1
95	19.7	17.3	33.89	.32	4	88.9	50.12	72.5	70.1	95.64	.94	1
96	19.5	17.1	33.90	.31	4	88.9	50.60	72.7	70.3	96.63	.95	1
97	19.3	17.0	33.90	.31	4	88.9	51.07	72.9	70.5	97.63	.95	1
98	19.1	16.8	33.90	.31	4	88.9	51.55	73.0	70.7	98.62	.95	1
99	19.0	16.6	33.90	.30	4	88.9	52.02	73.2	70.9	99.61	.95	1
100	18.8	16.5	33.90	.30	4	88.9	52.50	73.3	71.0	100.61	.95	1
101	18.6	16.3	33.91	.30	4	88.9	52.97	73.5	71.2	101.60	.95	1
102	18.4	16.2	33.91	.30	4	88.9	53.45	73.7	71.4	102.60	.95	1
103	18.3	16.0	33.91	.29	4	88.9	53.93	73.8	71.5	103.59	.95	1
104	18.1	15.9	33.91	.29	4	88.9	54.41	73.9	71.7	104.59	.95	1
105	18.0	15.8	33.91	.29	4	89.0	54.88	74.1	71.9	105.58	.95	1
106	17.8	15.6	33.91	.28	4	89.0	55.36	74.2	72.0	106.58	.95	1
107	17.6	15.4	33.92	.28	4	89.0	55.84	74.4	72.2	107.57	.96	1
108	17.5	15.3	33.92	.28	4	89.0	56.32	74.5	72.4	108.57	.96	1
109	17.3	15.2	33.92	.28	4	89.0	56.80	74.7	72.5	109.56	.96	1
110	17.2	15.0	33.92	.28	4	89.0	57.28	74.8	72.7	110.56	.96	1
111	17.0	14.9	33.92	.28	4	89.0	57.76	74.9	72.8	111.56	.96	1
112	16.9	14.8	33.92	.27	4	89.0	58.24	75.0	73.0	112.55	.96	1
113	16.7	14.7	33.92	.27	4	89.0	58.72	75.2	73.1	113.55	.96	1
114	16.6	14.6	33.92	.27	4	89.0	59.20	75.3	73.3	114.54	.96	1
115	16.4	14.4	33.93	.27	4	89.0	59.68	75.4	73.4	115.54	.96	1
116	16.3	14.3	33.93	.26	4	89.0	60.17	75.5	73.5	116.53	.96	1
117	16.2	14.2	33.93	.26	4	89.1	60.65	75.7	73.7	117.53	.96	1
118	16.1	14.1	33.93	.26	4	89.1	61.13	75.8	73.8	118.52	.96	1
119	15.9	14.0	33.93	.26	4	89.1	61.61	75.9	73.9	119.52	.96	1
120	15.8	13.9	33.93	.26	4	89.1	62.10	76.0	74.0	120.52	.96	1
121	15.7	13.8	33.93	.25	4	89.1	62.58	76.1	74.2	121.51	.96	1

32 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
122	15.5	13.6	33.93	.25	4	89.1	63.06	76.2	74.3	122.51	.96	1
123	15.4	13.5	33.93	.25	4	89.1	63.55	76.3	74.4	123,50	.96	1
124	15.3	13.4	33.94	.25	4	89.1	64.03	76.4	74.6	124.50	.97	1
125	15.2	13.3	33.94	.25	4	89.1	64.51	76.5	74.7	125.50	.97	1
126	15.1	13.2	33.94	.24	4	89.1	65.00	76.7	74.8	126.49	.97	1
127	15.0	13.1	33.94	24	4	89.1	65.48	76.8	74.9	127.49	.97	1
128	14.9	13.0	33.94	.24	4	89.1	65.97	76.9	75.0	128.49	.97	1
129	14.8	12.9	33.94	.24	4	89.1	66.46	77.0	75.1	129.48	.97	1
130	14.6	12.8	33.94	.24	4	89.1	66.94	77.1	75.2	130.48	.97	1
131	14.5	12.7	33.94	.24	4	89.1	67.42	77.2	75.3	131.48	.97	1
132	14.4	12.6	33.94	.23	4	89.2	67.91	77.3	75.4	132.47	.97	1

33 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH; DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
33	47.4	42.2	34.41	.70	3	87.5	23.33					
34	46.5	41.4	34.44	.69	3	87.6	23.69	48.2	43.1	35.39	.72	3
35	45.7	40.6	34.46	.68	3	87.6	24.05	49.0	44.0	36.37	.73	3
36	44.8	39.8	34.47	.67	3	87.7	24.42	49.8	44.8	37.35	.73	3
37	44.0	39.1	34.49	.66	3	87.7	24.79	50.6	45.6	38.33	.74	2
38	43.2	38.3	34.51	.65	3	87.7	25.16	51.3	46.4	39.31	.75	2
39	42.5	37.7	34.53	.64	3	87.8	25.54	52.0	47.2	40.29	.76	2
40	41.7	37.0	34.54	.63	3	87.8	25.93	52.7	47.9	41.27	.77	2
41	41.0	36.3	34.56	.62	3	87.8	26.31	53.3	48.7	42.25	.78	2
42	40.3	35.7	34.57	.61	3	87.9	26.71	54.0	49.4	43.23	.78	2
43	39.6	35.1	34.59	.61	3	87.9	27.10	54.6	50.1	44.22	.79	2
44	39.0	34.5	34.60	.60	3	87.9	27.50	55.2	50.8	45.20	.80	2
45	38.3	33.9	34.61	.59	3	87.9	27.90	55.8	51.4	46.18	.80	2
46	37.6	33.3	34.63	.58	3	88.0	28.31	56.4	52.0	47.17	.81	2
47	37.0	32.8	34.64	.57	3	88.0	28.71	56.9	52.6	48.15	.82	2
48	36.5	32.2	34.65	.56	3	88.0	29.12	57.5	53.2	49.13	.82	2
49	35.9	31.7	34.66	.56	3	88.1	29.54	58.0	53.8	50.12	.83	2
50	35.3	31.2	34.67	.55	3	88.1	29.95	58.5	54.4	51.10	.83	2
51	34.8	30.7	34.68	.54	3	88.1	30.37	59.0	55.0	52.09	.84	2
52	34.2	30.3	34.69	.53	3	88.1	30.79	59.4	55.5	53.07	.84	2
53	33.7	29.8	34.70	.53	3	88.2	31.22	59.9	56.0	54.06	.85	2
54	33.2	29.3	34.71	.52	3	88.2	31.64	60.4	56.5	55.04	.85	2
55	32.7	28.9	34.72	.51	3	88.2	32.07	60.8	57.0	56.03	.86	2
56	32.2	28.5	34.72	.51	3	88.2	32.50	61.2	57.5	57.02	.86	2
57	31.8	28.1	34.73	.50	3	88.3	32.93	61.7	57.9	58.00	.86	2
58	31.3	27.7	34.74	.49	3	88.3	33.37	62.1	58.4	58.99	.87	2
59	30.9	27.3	34.75	.49	3	88.3	33.80	62.5	58.8	59.98	.87	2
60	30.5	26.9	34.75	.48	3	88.3	34.24	62.9	59.3	60.96	.87	2
61	30.0	26.5	34.76	.47	3	88.3	34.68	63.2	59.7	61.95	.88	2
62	29.6	26.1	34.77	.47	3	88.3	35.12	63.6	60.1	62.94	.88	2

33 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
63	29.2	25.8	34.77	.46	3	88.4	35.56	64.0	60.5	63.93	.88	1
64	28.8	25.4	34.78	.46	3	88.4	36 00	64.3	60.9	64.92	.89	1
65	28.5	25.1	34.78	.45	3	88.4	36.45	64.6	61.3	65.91	.89	1
66	28.1	24.8	34.79	.45	3	88.4	36.89	65.0	61.7	66.90	.89	1
67	27.7	24.5	34.79	.44	3	88.5	37.34	65.3	62.0	67.88	.89	1
68	27.4	24.1	34.80	43	3	88.5	37.79	65.6	62.4	68.87	.90	1
69	27 0	23 8	34.80	.43	3	88 5	38.24	66 0	62.7	69.86	.90	1
70	26 6	23.5	34.81	.42	3	88.5	38.69	66.2	63.1	70.85	.90	1
71	26.3	23.2	3482	.42	3	88.5	39.15	66 5	63.4	71.84	.91	1
72	26 0	23 0	34.82	.41	3	88 5	39 60	66.8	63 8	72.83	.91	1
73	25 7	22.7	34.82	41	3	88.6	40.06	67.1	64.1	73.83	.91	1
74	25.4	22.4	34.83	.41	3	88.6	40.51	67.4	64.4	74.82	.91	1
75	25.1	22.2	34.83	.40	3	88.6	40.97	67.6	64.7	75.81	.91	1
76	24 8	21.9	34.84	.40	3	88.6	41.43	67.9	65.0	76.80	.92	1
77	24.5	21.6	34.84	.39	3	88.6	41.89	68.2	65.3	77.79	.92	1
78	24.2	21.4	34.84	.39	3	88.6	42 35	68.4	65.5	78.78	.92	1
79	24 0	21.1	3485	.38	3	88.7	42.81	68.7	65.8	79.77	.92	1
80	23 7	20.9	34.85	.38	3	88.7	43.27	68.9	66.1	80.76	.92	1
81	23 4	20.6	34.85	.37	3	88.7	43.73	69.1	66.4	81.75	.92	1
82	23.1	20.4	34.86	.37	3	88.7	44.20	69.4	66.6	82.75	.93	1
83	22.9	20 2	3486	.37	3	88.7	44.66	69.6	66.9	83.74	.93	1
84	22 6	20.0	34.86	36	3	88.7	45.12	69.8	67.1	84.73	.93	1
85	22.4	19.8	34.87	.36	3	88.7	45.59	70.0	67.4	85.72	.93	1
86	22.2	19.6	34.87	.35	3	88.8	46.06	70.2	67.6	86.71	.93	1
87	21.9	19.3	3487	.35	3	88.8	46.52	70.5	67.9	87.71	.93	1
88	21.7	19.1	34.87	.35	3	88.8	46.99	70.7	68.1	88.70	.93	1
89	21.5	18.9	34.88	.34	3	88.8	47.46	70.9	68.3	89.69	.94	1
90	21.3	18.7	34.88	.34	3	88.8	47.93	71.1	68.5	90.69	.94	1
91	21.1	18.6	3488	.34	3	88.8	48.40	71.3	68.7	91.68	.94	1
92	20.8	18.4	3488	.33	3	88.8	4887	71.5	68.9	92.67	.94	1

33	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
93	20.6	18.2	34.89	.33	3	88.8	49.34	71.6	69.2	93.67	.94	1
94	20.4	18.0	34.89	.33	3	88.8	49.81	71.8	69.4	94.66	.94	1
95	20.2	17.8	34.89	.33	3	88.9	50.28	72.0	69.6	95.66	.94	1
96	20.0	17.6	34.89	.32	3	88.9	50.76	72.2	69.8	96.65	.94	1
97	19.8	17.5	34.89	.32	3	88.9	51.23	72.3	70.0	97.64	.94	1
98	19.6	17.3	34.90	.32	3	88.9	51.70	72.5	70.2	98.64	.95	1
99	19.5	17.1	34.90	.31	3	88.9	52.18	72.7	70.4	99.63	.95	1
100	19.3	17.0	34.90	.31	3	88.9	52.65	72.8	70.5	100.63	.95	1
101	19.1	16.8	34.90	.31	3	88.9	53.13	73.0	70.7	101.62	.95	1
102	18.9	16.7	34.90	.30	4	88.9	53.60	73.2	70.9	102.61	.95	1
103	18.8	16.5	34.90	.30	4	88.9	54.08	73.3	71.1	103.61	.95	1
104	18.6	16.4	34.91	.30	4	88.9	54.55	73.5	71.2	104.60	.95	1
105	18.4	16.2	34.91	.30	4	89.0	55.03	73.6	71.4	105.60	.95	1
106	18.3	16.1	34.91	.29	4	89.0	55.51	73.8	71.6	106.59	.95	1
107	18.1	16.0	34.91	.29	4	89.0	55.99	73.9	71.7	107.59	.95	1
108	18.0	15.8	34.91	.29	4	89.0	56.46	74.0	71.9	108.58	.95	1
109	17.8	15.7	34.91	.29	4	89.0	56.94	74.2	72.0	109.58	.95	1
110	17.6	15.5	34.91	.28	4	89.0	57.42	74.3	72.2	110.57	.95	1
111	17.5	15.4	34.92	.28	4	89.0	57.90	74.5	72.4	111.57	.96	1
112	17.3	15.3	34.92	.28	4	89.0	58.38	74.6	72.5	112.57	.96	1
113	17.2	15.1	34.92	.28	4	89.0	58.86	74.7	72.7	113.56	.96	1
114	17.0	15.0	34.92	.28	4	89.0	59.34	74.8	72.8	114.56	.96	1
115	16.9	14.9	34.92	.27	4	89.0	59.82	75.0	72.9	115.55	.96	1
116	16.8	14.8	34.92	.27	4	89.0	60.30	75.1	73.1	116.55	.96	1
117	16.7	14.7	34.92	.27	4	89.1	60.78	75.2	73.2	117.54	.96	1
118	16.5	14.5	34.93	.27	4	89.1	61.26	75.3	73.3	118.54	.96	1
119	16.4	14.4	34.93	.26	4	89.1	61.74	75.5	73.5	119.53	.96	1
120	16.3	14.3	34.93	.26	4	89.1	62.23	75.6	73.6	120.53	.96	1
121	16.1	14.2	34.93	.26	4	89.1	62.71	75.7	73.7	121.53	.96	1
122	16.0	14.1	34.93	.26	4	89.1	63.19	75.8	73.9	122.52	.96	1

33 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
123	15.9	14.0	34.93	.26	4	89.1	63.67	75.9	74.0	123.52	.96	1
124	15.7	13.9	34.93	.25	4	89.1	64.16	76.0	741	124.51	.96	1
125	15.6	13.8	34.93	.25	4	89.1	64.64	76.1	74.2	125.51	.96	1
126	15.5	13.6	34.93	.25	4	89.1	65.12	76.2	74.4	126.51	.96	1
127	15.4	13.5	34.93	.25	4	89.1	65.61	76.3	74.5	127.50	.96	1
128	15.3	13.4	34.94	.25	4	89.1	66.09	76.4	746	128.50	97	1
129	15.2	13.3	34.94	.25	4	89.1	66.58	76.5	74.7	129.50	.97	1
130	15.0	13.2	34.94	.24	4	89.1	6706	76.6	74.8	130.49	.97	1
131	14.9	13.1	34.94	.24	4	89.1	67.58	76.7	749	131.49	.97	1
132	14.8	13.0	34.94	.24	4	89.2	68.03	76.8	75.0	132.49	.97	1

34 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
34	47.4	42.2	35.41	.70	3	87.6	24.04					
35	46.5	41.5	35.44	.69	3	87.6	24.40	48.1	43.1	36.39	.72	3
36	45.7	40.7	35.45	.68	3	87.7	24.76	48.9	44.0	37.37	.72	3
37	44.8	40.0	35.47	.67	3	87.7	25.12	49.7	44.8	38.35	.73	2
38	44.1	39.2	35.49	.66	3	87.7	25.49	50.4	45.6	39.33	.74	2
39	43.3	38.5	35.51	.65	3	87.8	25.87	51.1	46.4	40.31	.75	2
40	42.5	37.9	35.52	.64	3	87.8	26.25	51.8	47.1	41.29	.76	2
41	41.8	37.2	35.54	.63	3	87.8	26.63	52.5	47.9	42.27	.77	2
42	41.1	36.6	35.55	.63	3	87.9	27.02	53.1	48.6	43.26	.77	2
43	40.4	35.9	35.57	.62	3	87.9	27.41	53.7	49.3	44.24	.78	2
44	39.8	35.3	35.58	.61	3	87.9	27.80	54.3	49.9	45.22	.79	2
45	39.1	34.7	35.60	.60	3	88.0	28.20	55.0	50.6	46.20	.80	2
46	38.5	34.2	35.61	.59	3	88.0	28.60	55.5	51.2	47.19	.80	2
47	37.9	33.6	35.62	.58	3	88.0	29.00	56.1	51.9	48.17	.81	2
48	37.2	33.1	35.63	.58	3	88.0	29.41	56.6	52.5	49.16	.81	2
49	36.7	32.5	35.65	.57	3	88.1	29.82	57.2	53.0	50.14	.82	2
50	36.1	32.0	35.66	.56	3	88.1	30.23	57.7	53.6	51.12	.83	2
51	35.6	31.5	35.67	.55	3	88.1	30.65	58.2	54.2	52.11	.83	2
52	35.0	31.1	35.68	.54	3	88.2	31.06	58.7	54.7	53.09	.84	2
53	34.5	30.6	35.68	.54	3	88.2	31.48	59.1	55.2	54.08	.84	2
54	34.0	30.1	35.69	.53	3	88.2	31.91	59.6	55.7	55.07	.84	2
55	33.5	29.7	35.70	.52	3	88.2	32.33	60.0	56.2	56.05	.85	2
56	33.0	29.2	35.71	.52	3	88.2	32.76	60.5	56.7	57.04	.85	2
57	32.5	28.8	35.72	.51	3	88.3	33.18	60.9	57.2	58.03	.86	2
58	32.1	28.4	35.73	.50	3	88.3	33.62	61.3	57.7	59.01	.86	2
59	31.6	28.0	35.73	.50	3	88.3	34.05	61.7	58.1	60.00	.86	2
60	31.2	27.6	35.74	.49	3	88.3	34.48	62.1	58.6	60.99	.87	2
61	30.8	27.2	35.75	.48	3	88.4	34.92	62.5	59.0	61.97	.87	2
62	30.4	26.9	35.75	.48	3	88.4	35.36	62.9	59.4	62.96	.87	2
63	30.0	26.5	35.76	.47	3	88.4	35.79	63.2	59.8	63.95	.88	2

	PINION					PINION AND GEAR		GEAR				
34 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
64	29.5	26.2	35.77	.47	3	88.4	36.23	63.6	60.2	64.94	.88	1
65	29.2	25.8	35.77	.46	3	88.4	36.68	63.9	60.6	65.93	.88	1
66	28.8	25.5	35.78	.46	3	88.5	37.12	64.3	61.0	66.92	.89	1
67	28.4	25.1	35.78	.45	3	88.5	37.57	64.6	61.4	67.91	.89	1
68	28.1	24.8	35.79	.45	3	88.5	38.01	64.9	61.7	68.90	.89	1
69	27.7	24.5	35.79	.44	3	88.5	38.46	65.3	62.1	69.88	.89	1
70	27.3	24.2	35.80	.43	3	88.5	38.91	65.6	62.5	70.87	.90	1
71	27.0	23.9	35.80	.43	3	88.5	39.36	65.9	62.8	71.86	.90	1
72	26.7	23.6	35.81	.43	3	88.6	39.81	66.2	63.1	72.86	.90	1
73	26.3	23.3	35.81	.42	3	88.6	40.26	66.5	63.4	73.85	.90	1
74	26.0	23.0	35.82	.42	3	88.6	40.72	66.7	63.8	74.84	.91	1
75	25.7	22.8	35.82	.41	3	88.6	41.17	67.0	64.1	75.83	.91	1
76	25.4	22.5	35.83	.41	3	88.6	41.63	67.3	64.4	76.82	.91	1
77	25.1	22.3	35.83	.40	3	88.6	42.09	67.5	64.6	77.81	.91	1
78	24.9	22.0	35.83	.40	3	88.6	42.54	67.8	64.9	78.80	.91	1
79	24.6	21.8	35.84	.39	3	88.7	43.00	68.0	65.2	79.79	.92	1
80	24.3	21.5	35.84	.39	3	88.7	43.46	68.3	65.5	80.78	.92	1
81	24.0	21.3	35.85	.38	3	88.7	43.92	68.5	65.8	81.77	.92	1
82	23.8	21.0	35.85	.38	3	88.7	44.38	68.8	66.0	82.77	.92	1
83	23.5	20.8	35.85	.38	3	88.7	44.85	69.0	66.3	83.76	.92	1
84	23.2	20.6	35.85	37	3	88.7	45.31	69.2	66.6	84.75	.92	1
85	23.0	20.4	35.86	37	3	88.7	45.77	69.5	66.8	85.74	.93	1
86	22.8	20.2	35.86	.36	3	88.8	46.24	69.7	67.0	86.73	.93	1
87	22.5	20.0	35.86	.36	3	88.8	46.70	69.9	67.3	87.73	.93	1
88	22.3	19.7	35.87	.36	3	88.8	47.17	70.1	67.5	88.72	.93	1
89	22.0	19.5	35.87	35	3	88.8	47.64	70.3	67.8	89.71	.93	1
90	21.8	19.3	35.87	.35	3	88.8	48.10	70.5	68.0	90.71	.93	1
91	21.6	19.1	35.87	35	3	88.8	48.57	70.7	68.2	91.70	.93	1
92	21.4	18.5	35.88	34	3	88.8	49.04	70.9	68.4	92.69	.94	1
93	21.2	18.7	35.88	34	3	88.8	49.51	71.1	68.6	93.69	.94	1

34 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
94	21.0	18.5	35.88	.34	3	88.9	49.98	71.3	68.8	94.68	.94	1
95	20.8	18.4	35.88	33	3	88.9	50.45	71.4	69.0	95.67	94	1
96	20.6	18.2	35.89	.33	3	88.9	50.92	71.6	69.2	96.67	94	1
97	20.4	18.0	35.89	33	3	88 9	51.39	71.8	69.4	97.66	.94	1
98	20.2	17.8	35.89	32	3	88.9	51.86	72.0	69.6	98.65	.94	1
99	20.0	17.7	35.89	32	3	88.9	52.34	72.2	69.8	99.65	94	1
100	19.8	17.5	35.89	.32	3	88.9	52.81	72.3	70.0	100.64	94	1
101	19.6	17.3	35.90	.32	3	88 9	53.28	72 5	70.2	101.64	.95	1
102	19.4	17.2	35.90	31	3	88.9	53.76	72.6	70.4	102.63	.95	1
103	19.3	17.0	35.90	.31	3	88.9	54.23	72.8	70.6	103.63	.95	1
104	19.1	16.9	35.90	.31	3	88.9	54.71	73.0	70.7	104.62	95	1
105	18.9	16.7	35.90	.31	3	89.0	55.18	73 1	70.9	105.62	.95	1
106	18.8	16.6	35.90	.30	3	89.0	55.66	73.3	71.1	106.61	.95	1
107	18.6	16.5	35.91	.30	3	89.0	56.14	73.4	71.2	107.60	.95	1
108	18.5	16.3	35.91	.30	3	89.0	56.61	73.6	71.4	108.60	.95	1
109	18.3	16.2	35.91	.29	3	89.0	57.09	73.7	71.6	109.59	.95	1
110	18.1	16.0	35.91	.29	3	89.0	57.57	73.8	71.7	110.59	.95	1
111	17.9	15.9	35.91	.29	3	89.0	58.04	74.0	71.9	111 59	.95	1
112	17.8	15.7	35.91	.29	3	89.0	58.52	74 1	72.0	112 58	.95	1
113	17.6	15.6	35.91	.29	3	89.0	59.00	74 3	72 2	113.58	.95	1
114	17.5	15.5	35.91	.28	3	89.0	59.48	74 9	72.3	114.57	.95	1
115	17.4	15.3	35.92	.28	3	89.0	59.96	74.5	72.5	115.57	.96	1
116	17.2	15.2	35.92	.28	3	89.0	60.44	74.6	72.6	116.56	.96	1
117	17.1	15.1	35.92	.28	3	89.1	60.92	74.8	72.8	117.56	.96	1
118	17.0	15.0	35.92	.27	3	89.1	61.40	74.9	72.9	118.55	.96	1
119	16.8	14.9	35.92	.27	3	89.1	61.88	75.0	73.0	119.55	.96	1
120	16.7	14.7	35.92	.27	3	89.1	62.36	75.1	73.2	120.54	.96	1
121	16.5	14.6	35.92	.27	3	89.1	62.84	75.2	73.3	121.54	.96	1
122	16.4	14.5	35.93	.27	3	89.1	63.32	75.3	73.4	122.54	.96	1
123	16.3	14.4	35.93	.26	3	89.1	63.80	75.5	73.6	123.53	.96	1

34 TEETH INTO	PINION FACE ANGLE	PINION CUTTING ANGLE	PINION OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	PINION BACKING FOR 1 PITCH. DIVIDE BY PITCH	PINION NO. OF CUTTER TO USE	PINION AND GEAR BACK ANGLE	PINION AND GEAR PITCH CONE RADIUS. DIVIDE BY PITCH	GEAR FACE ANGLE	GEAR CUTTING ANGLE	GEAR OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	GEAR BACKING FOR 1 PITCH. DIVIDE BY PITCH	GEAR NO. OF CUTTER TO USE
124	16.2	14.3	35.93	.26	3	89.1	64.29	75.6	73.7	124.53	.96	1
125	16.0	14.2	35.93	.26	3	89.1	64.77	75.7	73.8	125.52	.96	1
126	15.9	14.1	35.93	.26	3	89.1	65.25	75.8	73.9	126.52	.96	1
127	15.8	14.0	35.93	.26	3	89.1	65.74	75.9	74.0	127.52	.96	1
128	15.7	13.9	35.93	.25	3	89.1	66.22	76.0	74.2	128.51	.96	1
129	15.6	13.8	35.93	.25	3	89 1	66.70	76.1	74.3	129.51	.96	1
130	15.4	13 7	35.93	.25	3	89.1	67.18	76.2	74.4	130.51	96	1
131	15.3	13 6	35.94	.25	3	89 2	67.67	76 3	74.5	131.50	97	1
132	15.2	13.5	35.94	.25	3	89 2	68.15	76 4	74.6	132.50	.97	1

35 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
35	47.3	42.3	36.41	.70	3	87.7	24.75					
36	46.5	41.6	36.43	.69	3	87.7	25.10	48.1	43.2	37.39	.71	3
37	45.7	40.8	36.45	.68	3	87.7	25.47	48.8	44.0	38.37	.72	3
38	44.8	40.1	36.47	.67	3	87.8	25.83	49.6	44.8	39.35	.73	2
39	44.1	39.4	36.49	.66	3	87.8	26.20	50.3	45.6	40.33	.74	2
40	43.3	38.7	36.51	.66	3	87.8	26.57	51.0	46.3	41.32	.75	2
41	42.6	38.0	36.52	.65	3	87.9	26.95	51.6	47.1	42.30	.76	2
42	41.9	37.4	36.54	.64	3	87.9	27.34	52.3	47.8	43.28	.77	2
43	41.2	36.8	36.55	.63	3	87.9	27.72	52.9	48.5	44.26	.77	2
44	40.5	36.2	36.57	.62	3	88.0	28.11	53.5	49.1	45.24	.78	2
45	39.9	35.5	36.58	.61	3	88.0	28.50	54.1	49.8	46.23	.79	2
46	39.2	35.0	36.59	.60	3	88.0	28.90	54.7	50.5	47.21	.79	2
47	38.6	34.4	36.60	.59	3	88.0	29.30	55.3	51.1	48.19	.80	2
48	38.0	33.9	36.62	.59	3	88.1	29.70	55.8	51.7	49.18	.81	2
49	37.4	33.3	36.63	.58	3	88.1	30.11	56.3	52.3	50.16	.81	2
50	36.9	32.8	36.64	.57	3	88.1	30.52	56.9	52.9	51.15	.82	2
51	36.3	32.3	36.65	.56	3	88.1	30.93	57.4	53.4	52.13	.82	2
52	35.8	31.8	36.66	.56	3	88.2	31.34	57.9	54.0	53.12	.83	2
53	35.2	31.4	36.67	.55	3	88.2	31.76	58.4	54.5	54.10	.83	2
54	34.7	30.9	36.68	.54	3	88.2	32.17	58.8	55.0	55.09	.84	2
55	34.2	30.5	36.69	.53	3	88.2	32.60	59.3	55.5	56.07	.84	2
56	33.7	30.0	36.70	.53	3	88.3	33.02	59.7	56.0	57.06	.85	2
57	33.2	29.6	36.71	.52	3	88.3	33.44	60.2	56.5	58.05	.85	2
58	32.8	29.1	36.71	.52	3	88.3	33.87	60.6	57.0	59.04	.85	2
59	32.3	28.8	36.72	.51	3	88.3	34.30	61.0	57.4	60.02	.86	2
60	31.9	28.3	36.73	.50	3	88.3	34.73	61.4	57.9	61.01	.86	2
61	31.5	28.0	36.74	.50	3	88.4	35.16	61.8	58.3	62.00	.87	2
62	31.1	27.6	36.74	.49	3	88.4	35.60	62.2	58.7	62.99	.87	2
63	30.6	27.2	36.75	.48	3	88.4	36.03	62.5	59.1	63.97	.87	2
64	30.2	26.9	36.76	.48	3	88.4	36.47	62.9	59.5	64.96	.88	2

	PINION					PINION AND GEAR		GEAR				
35 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
65	29.8	26.5	36.76	.47	3	88.4	36.91	63.2	59.9	65.95	.88	1
66	29.5	26.2	36.77	.47	3	88.5	37.35	63.6	60.3	66.94	.88	1
67	29.1	25.8	36.77	.46	3	88.5	37.79	63.9	60.7	67.93	.88	1
68	28.7	25.5	36.78	.46	3	88.5	38.24	64.2	61.0	68.92	.89	1
69	28.4	25.2	36.78	.45	3	88.5	38.68	64.6	61.4	69.91	.89	1
70	28.0	24.9	36.79	.45	3	88.5	39.13	64.9	61.8	70.90	.89	1
71	27.6	24.6	36.79	.44	3	88.5	39.58	65.2	62.1	71.88	.89	1
72	27.3	24.3	36.80	.43	3	88.6	40.03	65.5	62.5	72.87	.90	1
73	27.0	24.0	36.80	.43	3	88.6	40.48	65 8	62.8	73.87	.90	1
74	26.7	23.7	3681	.43	3	88 6	40.93	66.1	63.1	74.86	.90	1
75	26.3	23.4	36.81	.42	3	88.6	41.38	66.4	63.5	75.85	.90	1
76	26.0	23.2	36.82	.42	3	88.6	41.84	66.6	63.8	76.84	.91	1
77	25.7	22.9	36.82	.41	3	88.6	42.29	66.9	64.1	7783	.91	1
78	25.4	22.6	36.83	.41	3	88.7	42.76	67.2	64.3	78.82	.91	1
79	25.2	22.4	36.83	.40	3	88.7	43.20	67.4	64.6	79.81	.91	1
80	24.9	22.1	36.83	.40	3	88.7	43.66	67.7	64.9	80.80	.91	1
81	24.6	21.9	36.84	.39	3	88.7	44.12	67.9	65.2	81.79	.92	1
82	24.4	21.6	36.84	.39	3	88.7	44.58	68.2	65.5	82.79	.92	1
83	24.1	21.4	36.84	.39	3	88.7	45.04	68.4	65.7	83.78	.92	1
84	23.8	21.2	36.85	.38	3	88.7	45.50	68.6	66.0	84.77	.92	1
85	23.6	21.0	36.85	.38	3	88.7	45.96	68.9	66.3	85.76	.92	1
86	23.3	20.7	36.85	.37	3	88.8	46.42	69.1	66.5	86.75	.92	1
87	23.1	20.5	36.86	.37	3	88.8	46.89	69.3	66.7	87.75	.93	1
88	22.8	20.3	36.86	.37	3	88.8	47.35	69.5	67.0	88.74	.93	1
89	22.6	20.1	36.86	.36	3	88.8	47.82	69.7	67.2	89.73	.93	1
90	22.4	19.9	36.86	.36	3	88.8	48.28	69.9	67.4	90.72	.93	1
91	222	19.7	36.87	.36	3	88.8	48.75	70.1	67.6	91.72	.93	1
92	22.0	19.5	36.87	.35	3	88.8	49.22	70.3	67.9	92.71	.93	1
93	21.7	19.3	36.87	.35	3	88.8	49.68	70.5	68.1	93.70	.93	1
94	21.5	19.1	3687	.35	3	88.9	50.15	70.7	68.3	94.70	.93	1

	PINION					PINION AND GEAR		GEAR				
35 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
95	21.3	18.9	36.88	.34	3	88.9	50.62	70.9	68.5	95.69	.94	1
96	21.1	18.7	36.88	.34	3	88.9	51.09	71.1	68.7	96.68	.94	1
97	20.9	18.5	36.88	.34	3	88.9	51.56	71.3	68.9	97.68	.94	1
98	20.7	18.4	36.88	.33	3	88.9	52.03	71.4	69.1	98.67	.94	1
99	20.5	18.2	36.89	.33	3	88.9	52.50	71.6	69.3	99.67	.94	1
100	20.3	18.0	36.89	33	3	88.9	52.97	71.8	69.5	100.66	.94	1
101	20.1	17.9	36.89	32	3	88.9	53.44	72.0	69.7	101.65	.94	1
102	20.0	17.7	36.89	.32	3	88.9	53.92	72.1	69.9	102.65	.94	1
103	19.8	17.5	36.89	.32	3	88.9	54.39	72.3	70.1	103.64	.94	1
104	19.6	17.4	36.90	.32	3	89.0	54.86	72.5	70.2	104.64	.95	1
105	19.4	17.2	36.90	.31	3	89.0	55.34	72.6	70.4	105.63	.95	1
106	19.2	17.1	36.90	.31	3	89.0	55.81	72.8	70.6	106.63	.95	1
107	19.1	16.9	36.90	.31	3	89.0	56.29	72.9	70.8	107.62	.95	1
108	18.9	16.8	36.90	.31	3	89.0	56.76	73.1	70.9	108.62	.95	1
109	18.7	16.6	36.90	.30	3	89.0	57.24	73.2	71.1	109.61	.95	1
110	18.6	16.5	36.91	.30	3	89.0	57.72	73.4	71.2	110.61	.95	1
111	18.4	16.3	36.91	.30	3	89.0	58.19	73.5	71.4	111.60	.95	1
112	18.3	16.2	36.91	.30	3	89.0	58.68	73.6	71.6	112.60	.95	1
113	18.1	16.1	36.91	.29	3	89.0	59.15	73.8	71.7	113.59	.95	1
114	18.0	16.0	36.91	.29	3	89.0	59.63	73.9	71.9	114.59	.95	1
115	17.8	15.8	36.91	29	3	89.0	60.10	74.0	72.0	115.58	.95	1
116	17.7	15.7	36.91	29	3	89.1	60.58	74.2	72.2	116.58	.95	1
117	17.5	15.6	36.92	.28	3	89.1	61.06	74.3	72.3	117.57	.96	1
118	17.4	15.4	36.92	.28	3	89.1	61.54	74.4	72.5	118.57	.96	1
119	17.3	15.3	36.92	.28	3	89.1	62.02	74.5	72.6	119.56	.96	1
120	17.1	15.2	36.92	.28	3	89.1	62.50	74.7	72.7	120.56	.96	1
121	17.0	15.1	36.92	.28	3	89.1	62.98	74.8	72.9	121.56	.96	1
122	16.9	15.0	36.92	27	3	89.1	63.46	74.9	73.0	122.55	.96	1
123	16.7	14.8	36.92	.27	3	89.1	63.94	75.0	73.1	123.55	.96	1
124	16.6	14.7	36.92	.27	3	89.1	64.42	75.1	73.3	124.54	.96	1

35 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
125	16.5	14.6	36.93	.27	3	89.1	64.90	75.2	73.4	125.54	.96	1
126	16.4	14.5	36.93	.27	3	89.1	65.38	75.9	73.5	126.54	.96	1
127	16.2	14.4	36.93	.26	3	89.1	65.87	75.5	73.6	127.53	.96	1
128	16.1	14.3	36.93	.26	3	89.1	66.35	75.6	73.8	128.53	.96	1
129	16.0	14.2	36.93	.26	3	89.1	66.83	75.7	73.9	129.52	.96	1
130	16.9	14.1	36.93	.26	3	89.1	67.32	75.8	74.0	130.52	.96	1
131	16.7	14.0	36.93	.26	3	89.2	67.80	75.9	74.1	131.52	.96	1
132	16.6	13.9	36.93	.25	3	89.2	68.28	76.0	74.2	132.51	.96	1

	PINION					PINION AND GEAR		GEAR				
36 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
36	47.2	42.9	37.41	.70	3	87.7	25.46					
37	46.4	41.7	37.43	.69	3	878	25.81	48.0	43.2	38.39	71	3
38	45.6	40.9	37.45	.69	3	87.8	26.17	48.7	44.0	39.38	.72	2
39	44.9	40 2	37.47	.68	3	87.8	26.54	49.4	44.8	40.36	.73	2
40	44.1	39.5	37.49	.67	3	87.9	26.91	50.1	45.6	41.34	.74	2
41	43.4	38.9	37.50	.66	3	87.9	27.28	50.8	46.3	42.32	.75	2
42	42.7	38.2	37.52	.65	3	87.9	27.66	51 5	47.0	43.30	.76	2
43	42.0	37.6	37.53	.64	3	88.0	28.04	52.1	47.7	44.28	.76	2
44	41.3	37.0	37.55	.63	3	88 0	28.42	52.7	48.4	45.26	.77	2
45	40.6	36.4	37.56	.62	3	88.0	28.81	53.3	49.0	46.25	.78	2
46	40.0	35.8	37.58	.61	3	88.0	29.21	53.9	49.7	47.23	.79	2
47	39.4	35.2	37.59	.60	3	88.1	29.60	54.5	50.3	48.21	.79	2
48	38.8	34.7	37.60	.60	3	88.1	30.00	55.0	50.9	49.20	.80	2
49	38 2	34.1	37.61	.59	3	88.1	30.40	55.5	51.5	50.18	.80	2
50	37.6	33.6	37.62	.58	3	88.1	30.81	56.1	52.1	51.17	.81	2
51	37 0	33.1	37.64	.57	3	88.2	31.21	56 6	52.7	52.15	.82	2
52	36.5	32.6	37.65	.57	3	88.2	31.62	57.1	53.2	53.14	.82	2
53	36.0	32.1	37.66	.56	3	88.2	32.03	57.6	53.8	54.12	.83	2
54	35.4	31.6	37.67	.55	3	88.2	32.45	58.1	54.3	55.11	.83	2
55	34.9	31.2	37.67	.55	3	88.3	32.87	58.5	54.8	56.10	.83	2
56	34.5	30.7	37.68	.54	3	88.3	33.29	59.0	55.3	57.08	.84	2
57	34.0	30.3	37.69	.53	3	88.3	33.71	59.4	55.8	58.07	.84	2
58	33.5	29.9	37.70	.53	3	88.3	34.13	59.8	56.3	59.06	.85	2
59	33.0	29.5	37.71	.52	3	88.3	34.56	60.3	56.7	60.04	.85	2
60	32.6	29.1	37.72	.51	3	88.4	34.99	60.7	57.2	61.03	.86	2
61	32 2	28.7	37.72	.51	3	88.4	35.42	61.1	57.6	62.02	.86	2
62	31.7	28.3	37.73	.50	3	88.4	35.85	61.5	58.0	63.01	.86	2
63	31.3	27.9	37.74	.49	3	88.4	36.28	61.8	58.5	63.99	.87	2
64	30.9	27.5	37.74	49	3	88.4	36.71	62.2	58.9	64.98	.87	2
65	30.5	27.2	37.75	.48	3	88.5	37.15	62.6	59.3	65.97	.87	1

36 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
66	30.1	26.8	37.76	.48	3	88 5	3759	62.9	59.7	66.96	88	1
67	29.7	26.5	37 76	47	3	88.5	38.03	63 3	60.0	67.95	88	1
68	294	26.2	37.77	.47	3	88 5	38.47	63.6	60 4	68.94	.88	1
69	29.0	25.8	37.77	.46	3	88.5	38.91	63.9	60 8	69.93	.88	1
70	28.6	25.6	37.78	.45	3	88.5	39.36	64 2	61.2	70.91	.89	1
71	28 3	25 3	37.78	.45	3	88 6	39.80	64.5	61.5	71.90	.89	1
72	27.9	25.0	37.79	45	3	88.6	40.25	64 8	61 8	72.90	89	1
73	27.6	24.7	37.79	.44	3	88.6	40.70	65.1	62 2	73.89	.89	1
74	27 3	24.4	37.80	.44	3	88 6	41.15	65.4	62.5	74.88	.90	1
75	27.0	24.1	37 80	43	3	88 6	4160	65.7	62.8	75.87	.90	1
76	26.7	23 8	37.81	.43	3	88 6	42 05	66 0	63.1	76.86	.90	1
77	26.4	23.5	37.81	.42	3	88 6	42.50	66 3	63.4	77.85	.90	1
78	26.1	23 3	37 82	.42	3	88.7	42 95	66.5	63.7	78.84	.91	1
79	25.8	23.0	37.82	.41	3	88.7	4341	66.8	64.0	79.83	.91	1
80	25.5	22 7	37.82	.41	3	88.7	43 86	67 1	64 3	80.82	.91	1
81	25 2	22 5	37.83	.40	3	88.7	44.32	67.3	64.6	81.81	.91	1
82	25 0	22 3	3783	.40	3	88 7	44.78	67 5	64.9	82.81	.91	1
83	24.7	22 0	37.84	.40	3	88 7	45.23	67 8	65.1	83 80	.92	1
84	24 4	21 8	37.84	.39	3	88 7	45.69	68 0	65.4	84.79	.92	1
85	24.1	21.5	37.84	.39	3	88 8	46.15	68 3	65.7	85.78	92	1
86	23.9	21 3	37.85	.38	3	88 8	46.62	68 5	65 9	86.77	.92	1
87	23.6	21.1	37.85	.38	3	88 8	47.08	68 7	66.2	87.76	92	1
88	23 4	20.9	37.85	.38	3	88 8	47.54	68.9	66.4	88 76	.92	1
89	23.2	20.7	37.85	.37	3	88.8	48.00	69.1	66.6	89.75	.92	1
90	23.0	20 5	37.86	.37	3	88 8	48 47	69.4	66.9	90.74	.93	1
91	22.7	20.3	37.86	.37	3	88.8	48.93	69 6	67.1	91.74	93	1
92	22 5	20.1	37.86	.36	3	88 8	49.40	69.8	67.3	92.73	.93	1
93	22 3	19.9	37.87	.36	3	88.8	49.86	70 0	67.5	93.72	.93	1
94	22.1	19.7	37 87	.35	3	88.9	50.33	70.2	67.8	94 71	.93	1
95	21.9	19.5	37.87	.35	3	88.9	50.80	70.4	68.0	95.71	.93	1

36 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
96	21.7	19.3	37.87	.35	3	88.9	51.26	70.5	68.2	96.70	.93	1
97	21.4	19.1	37.88	.35	3	88.9	51.73	70.7	68.4	97.70	.94	1
98	21.2	18.9	37.88	.34	3	88.9	52.20	70.9	68.6	98.69	.94	1
99	21.0	18.7	37.88	.34	3	88.9	52.67	71.1	68.8	99.68	.94	1
100	20.9	18.6	37.88	.34	3	88.9	53.14	71.3	69.0	100.68	.94	1
101	20.7	18.4	37.88	.33	3	88.9	53.61	71.4	69.2	101.67	.94	1
102	20.5	18.2	37.89	.33	3	88.9	54.08	71.6	69.4	102.67	.94	1
103	20.3	18.0	37.89	.33	3	89.0	54.55	71.8	69.5	103.66	.94	1
104	20.1	17.9	37.89	.32	3	89.0	55.03	71.9	69.7	104.65	.94	1
105	19.9	17.7	37.89	.32	3	89.0	55.50	72.1	69.9	105.65	.94	1
106	19.7	17.6	37.89	.32	3	89.0	55.97	72.3	70.1	106.65	.94	1
107	19.6	17.4	37.90	.32	3	89.0	56.45	72.4	70.3	107.65	.95	1
108	19.4	17.3	37.90	.31	3	89.0	56.92	72.6	70.5	108.63	.95	1
109	19.2	17.1	37.90	.31	3	89.0	57.40	72.7	70.6	109.63	.95	1
110	19.1	17.0	37.90	.31	3	89.0	57.87	72.9	70.8	110.62	.95	1
111	18.9	16.8	37.90	.31	3	89.0	58.35	73.0	71.0	111.62	.95	1
112	18.7	16.7	37.90	.30	3	89.0	58.82	73.2	71.1	112.61	.95	1
113	18.6	16.5	37.91	.30	3	89.0	59.30	73.3	71.3	113.61	.95	1
114	18.4	16.4	37.91	.30	3	89.0	59.77	73.4	71.4	114.60	.95	1
115	18.3	16.3	37.91	.30	3	89.0	60.25	73.6	71.6	115.60	.95	1
116	18.1	16.1	37.91	.29	3	89.1	60.73	73.7	71.7	116.59	.95	1
117	18.0	16.0	37.91	.29	3	89.1	61.21	73.8	71.9	117.59	.95	1
118	17.9	15.9	37.91	.29	3	89.1	61.68	74.0	72.0	118.58	.95	1
119	17.7	15.8	37.91	.29	3	89.1	62.16	74.1	72.2	119.58	.95	1
120	17.6	15.6	37.91	.29	3	89.1	62.64	74.2	72.3	120.58	.95	1
121	17.4	15.5	37.92	.28	3	89.1	63.12	74.3	72.4	121.57	.96	1
122	17.3	15.4	37.92	.28	3	89.1	63.60	74.5	72.6	122.57	.96	1
123	17.2	15.3	37.92	.28	3	89.1	64.08	74.6	72.7	123.56	.96	1
124	17.0	15.2	37.92	.28	3	89.1	64.56	74.7	72.8	124.56	.96	1
125	16.9	15.0	37.92	.28	3	89.1	65.04	74.8	73.0	125.56	.96	1

36 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
126	16.8	14.9	37.92	.27	3	89.1	65.52	74.9	73.1	126.55	.96	1
127	16.7	14.8	37.92	.27	3	89.1	66.00	75.0	73.2	127.55	.96	1
128	16.5	14.7	37.92	.27	3	89.1	66.48	75.1	73.3	128.59	.96	1
129	16.4	14.6	37.93	.27	3	89.1	66.96	75.3	73.5	129.54	.96	1
130	16.3	14.5	37.93	.26	3	89.1	67.44	75.4	73.6	130.53	.96	1
131	16.2	14.4	37.93	.26	3	89.2	67.93	75.5	73.7	131.53	.96	1
132	16.1	14.3	37.93	.26	3	89.2	68.41	75.6	73.8	132.53	.96	1

37 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
37	47.2	42.5	38.41	.70	3	87.8	26.16					
38	46.4	41.8	38.43	.70	3	87.8	26.52	47.9	43.3	39.40	.71	3
39	45.6	41.0	38.45	.69	3	87.9	26.88	48.6	44.0	40.38	.72	2
40	44.9	40.4	38.47	.68	3	87.9	27.25	49.3	44.8	41.36	.73	2
41	44.1	39.7	38.48	.67	3	87.9	27.61	50.0	45.5	42.34	.74	2
42	43.4	39.0	38.50	.66	3	87.9	27.99	50.7	46.3	43.32	.75	2
43	42.7	38.4	38.52	.65	3	88.0	28.38	51.3	47.0	44.30	.76	2
44	42.1	37.8	38.53	.64	3	88.0	28.74	52.0	47.7	45.29	.76	2
45	41.4	37.2	38.54	.63	3	88.0	29.13	52.5	48.3	46.27	.77	2
46	40.7	36.6	38.56	62	3	88.1	29.52	53.1	49.0	47.25	.78	2
47	40.1	36.0	38.57	.62	3	88.1	29.91	53.7	49.6	48.24	.78	2
48	39.5	35.5	38.58	.61	3	88.1	30.30	54.3	50.2	49.22	.79	2
49	38.9	34.9	38.60	.60	3	88.1	30.70	54.8	50.8	50.21	.80	2
50	38.3	34.4	38.61	.59	3	88.2	31.10	55.3	51.4	51.19	.80	2
51	37.8	33.9	38.62	.58	3	88.2	31.50	55.9	52.0	52.17	.81	2
52	37.2	33.4	38.63	.58	3	88.2	31.91	56.4	52.5	53.16	.81	2
53	36.7	32.9	38.64	.57	3	88.2	32.32	56.8	53.0	54.15	.82	2
54	36.1	32.4	38.65	.56	3	88.2	32.73	57.3	53.6	55.13	.82	2
55	35.6	31.9	38.66	.56	3	88.3	33.14	57.8	54.1	56.12	.83	2
56	35.1	31.5	38.67	.55	3	88.3	33.56	58.2	54.6	57.10	.83	2
57	34.6	31.0	38.68	.54	3	88.3	33.98	58.7	55.1	58.09	.84	2
58	34.2	30.6	38.69	.54	3	88.3	34.40	59.1	55.6	59.08	.84	2
59	33.7	30.2	38.70	.53	3	88.4	34.82	59.5	56.0	60.06	.85	2
60	33.3	29.8	38.70	.52	3	88.4	35.25	60.0	56.5	61.05	.85	2
61	32.8	29.4	38.71	.52	3	88.4	35.67	60.4	57.0	62.04	.86	2
62	32.4	29.0	38.72	.51	3	88.4	36.10	60.8	57.4	63.03	.86	2
63	32.0	28.6	38.73	.50	3	88.4	36.53	61.1	57.8	64.01	.86	2
64	31.6	28.2	38.73	.50	3	88.4	36.96	61.5	58.2	65.00	.86	2
65	31.2	27.9	38.74	.49	3	88.5	37.40	61.9	58.6	65.99	.87	2
66	30.8	27.5	38.75	.49	3	88.5	37.83	62.3	59.0	66.98	.87	1

37	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
67	30.4	27.2	38.75	.48	3	88.5	38.27	62.6	59.4	67.97	.87	1
68	30 0	26.8	38 76	.48	3	88.5	38.71	62.9	59.7	68.96	.88	1
69	29 6	26.5	38.76	.47	3	88.5	39.15	63.2	60.1	69.95	.88	1
70	29.2	26.2	38.77	.46	3	88.5	39.59	63.6	60.5	70.93	.88	1
71	28.9	25.9	38.77	.46	3	88.6	40.03	63.9	60.9	71.92	.88	1
72	28.6	25.6	38.78	.45	3	88.6	40.47	64.2	61.2	72.91	.89	1
73	28.2	25.3	38.78	.45	3	88.6	40.92	64.5	61.6	73.90	.89	1
74	27.9	25.0	38.79	.44	3	88 6	41.37	64.8	61.9	74.89	.89	1
75	27.6	24.7	38.79	.44	3	88.6	41.81	65.1	62.2	75.88	.89	1
76	27.2	24.4	38.80	.44	3	88.6	42.26	65.4	62.5	76.88	.90	1
77	26.9	24.1	38.80	.43	3	88.7	42.71	65.7	62.8	77.87	.90	1
78	26.6	23.9	38.81	.43	3	88.7	43.17	65.9	63.1	78.86	.90	1
79	26.3	23.6	38.81	.42	3	88.7	43.62	66.2	63.4	79.85	.90	1
80	26.1	23.3	38.82	.42	3	88.7	44.07	66.5	63.7	80.84	.91	1
81	25.8	23.1	38 82	.41	3	88.7	44.53	66.7	64.0	81.83	.91	1
82	25.5	22.8	38.82	.41	3	88.7	44.98	67.0	64.3	82.82	.91	1
83	25.2	22.6	38.83	.41	3	88.7	45.44	67.2	64.6	83.82	.91	1
84	25.0	22.3	38.83	.40	3	88.7	45.89	67.5	64.8	84.81	.91	1
85	24.7	22.1	38 84	.40	3	88.8	46.35	67.7	65.1	85.80	.92	1
86	24.5	21.9	38.84	.39	3	88.8	46.81	67.9	65.4	86.79	.92	1
87	24.2	21.7	38.84	.39	3	88.8	47.27	68.2	65.6	87.78	.92	1
88	24.0	21.4	38.84	.39	3	88.8	47.73	68.4	65.9	88.78	.92	1
89	23.7	21.2	38.85	.38	3	88.8	48.19	68.6	66.1	89.77	.92	1
90	23.5	21.0	38.85	.38	3	88.8	48.65	68.8	66.3	90.76	.92	1
91	23.2	20.8	38.85	.37	3	88.8	49.12	69.0	66.6	91.75	.92	1
92	23.0	20.6	38.86	.37	3	88.8	49.58	69.2	66.8	92.75	.93	1
93	228	20.4	38.86	.37	3	88.9	50.04	69.5	67.0	93.74	.93	1
94	22.6	20.2	38.86	.36	3	88.9	50.51	69.6	67.3	94.73	.93	1
95	22.4	20.0	38.86	.36	3	88.9	50.97	69.8	67.5	95.73	.93	1
96	22.2	19 8	38.87	.36	3	88.9	51.44	70.0	67.7	95.72	.93	1

	PINION					PINION AND GEAR		GEAR				
37 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
97	22.0	196	38.87	.35	3	88.9	51.91	70.2	67.9	97.71	93	1
98	21.8	19.4	38.87	.35	3	88.9	52.38	70.4	68.1	98.71	.93	1
99	21.5	192	3887	.35	3	88.9	52.84	70.6	68.3	99.70	.93	1
100	21.3	190	3888	.34	3	88.9	53.31	70.8	68.5	10069	.94	1
101	21.1	18.9	3888	.34	3	88.9	53.78	71.0	68.7	10169	.94	1
102	21.0	187	3888	.34	3	88.9	54.25	71.1	68.9	102.68	.94	1
103	208	18.5	3888	.34	3	88.9	54.72	71.3	69.1	103.68	.94	1
104	206	18.4	3888	.33	3	89.0	55.19	71.5	693	10467	.94	1
105	204	18.2	3889	.33	3	89.0	55.66	71.6	695	105.66	.94	1
106	202	18.1	3889	.33	3	890	56.14	71.8	69.6	106.66	.94	1
107	200	17.9	3889	.32	3	89.0	56.61	72.0	69.8	107.65	.94	1
108	19.9	17.7	38.89	.32	3	89.0	57.08	721	70.0	108.65	.94	1
109	197	17.6	3889	.32	3	89.0	57.55	723	70.1	109.64	.94	1
110	19.5	17.4	3890	.32	3	89.0	58.03	724	70.3	110.64	.95	1
111	193	17.3	38.90	.31	3	89.0	58.50	726	705	111.63	.95	1
112	19.2	17.1	3890	.31	3	89.0	58.98	72.7	70.7	112.63	.95	1
113	190	170	3890	.31	3	89.0	59.45	72.9	70.8	113.62	.95	1
114	18.9	169	3890	.31	3	89.0	59.93	73.0	71.0	114.62	.95	1
115	18.7	16.7	38.90	.30	3	890	60.40	73.1	71.1	115.61	.95	1
116	186	16.6	38.91	.30	3	89.1	60.88	73.3	71.3	116.61	.95	1
117	18.4	16.5	3891	.30	3	89.1	61.35	73.4	71.4	117.60	.95	1
118	183	163	3891	.30	3	89.1	61.83	73.5	71.6	118.60	.95	1
119	18.1	16.2	3891	.29	3	89.1	62.31	73.7	71.7	119.59	.95	1
120	18.0	16.1	3891	.29	3	89.1	62.79	73.8	71.9	120.59	.95	1
121	17.8	160	38.91	.29	3	89.1	63.26	73.9	72.0	121.58	.95	1
122	177	15.8	38.91	.29	3	89.1	63.74	74.0	72.1	122.58	.95	1
123	17.6	15.7	38.91	.29	3	89.1	64.22	74.2	72.3	123.58	.95	1
124	174	15.6	38.92	.28	3	89.1	64.70	74.3	72.4	124.57	.96	1
125	17.3	155	38.92	.28	3	89.1	65.18	74.4	72.5	125.57	.96	1
126	17.2	15.4	38.92	.28	3	89.1	65.66	745	72.7	126.56	.96	1

	PINION					PINION AND GEAR		GEAR				
37 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
127	17.0	15.2	38.92	.28	3	89.1	66.14	74.6	72.8	127.56	.96	1
128	16.9	15.1	38.92	.28	3	89.1	66.62	74.8	72.9	128.56	.96	1
129	16.8	15.0	38.92	.27	3	89.1	67.10	74.9	73.1	129.55	.96	1
130	16.7	14.9	38.92	.27	3	89.1	67.58	75.0	73.2	130.55	.96	1
131	16.6	14.8	38.92	.27	3	89.2	68.06	75.1	73.3	131.54	.96	1
132	16.4	14.7	38.92	.27	3	89.2	68.54	75.2	73.4	132.54	.96	1

38 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
38	47.1	42.5	39.41	.70	3	87.9	26.87					
39	46.4	41.9	39.43	.70	3	87.9	27.23	47.8	43.3	40.40	.71	2
40	45.6	41.2	39.45	.69	3	87.9	27.59	48.5	44.0	41.38	.72	2
41	44.9	40.5	39.47	.68	3	87.9	27.95	49.2	44.8	42.36	.73	2
42	44.1	39.8	39.48	.67	3	88.0	28.32	49.9	45.5	43.34	.74	2
43	43.5	39.2	39.50	.66	3	88.0	28.69	50.5	46.2	44.32	.75	2
44	42.8	38.5	39.51	.65	3	88.0	29.07	51.1	46.9	45.31	.75	2
45	42.1	37.9	39.53	.64	3	88.0	29.45	51.8	47.6	46.29	.76	2
46	41.5	37.4	39.54	.63	3	88.1	29.83	52.3	48.2	47.27	.77	2
47	40.8	36.8	39.55	.63	3	88.1	30.22	52.9	48.9	48.26	.77	2
48	40.2	36.2	39.57	.62	3	88.1	30.61	53.5	49.5	49.29	.78	2
49	39.6	35.7	39.58	.61	3	88.1	31.00	54.0	50.1	50.22	.79	2
50	39.0	35.1	39.59	.60	3	88.2	31.40	54.6	50.7	51.21	.79	2
51	38.5	34.6	39.60	.59	3	88.2	31.80	55.1	51.2	52.19	.80	2
52	37.9	34.1	39.62	.59	3	88.2	32.20	55.6	51.8	53.18	.81	2
53	37.4	33.6	39.63	.58	3	88.2	32.61	56.1	52.3	54.16	.81	2
54	36.9	33.1	39.64	.57	3	88.3	33.01	56.6	52.9	55.15	.82	2
55	36.4	32.7	39.65	.57	3	88.3	33.43	57.1	53.4	56.14	.82	2
56	35.8	32.2	39.66	.56	3	88.3	33.84	57.5	53.9	57.12	.83	2
57	35.4	31.8	39.67	.55	3	88.3	34.25	58.0	54.4	58.11	.83	2
58	34.9	31.3	39.67	.55	3	88.3	34.67	58.4	54.9	59.10	.83	2
59	34.4	30.9	39.68	.54	3	88.4	35.09	58.8	55.3	60.08	.84	2
60	34.0	30.5	39.69	.53	3	88.4	35.51	59.3	55.8	61.07	.84	2
61	33.5	30.1	39.70	.53	3	88.4	35.93	59.6	56.3	62.06	.85	2
62	33.1	29.7	39.71	.52	3	88.4	36.36	60.0	56.7	63.05	.85	2
63	32.6	29.3	39.71	.51	3	88.4	36.79	60.5	57.1	64.03	.85	2
64	32.2	28.9	39.72	.51	3	88.5	37.22	60.9	57.6	65.02	.86	2
65	31.8	28.6	39.73	.50	3	88.5	37.65	61.2	58.0	66.01	.86	2
66	31.4	28.2	39.73	.50	3	88.5	38.08	61.6	58.4	67.00	.86	2
67	31.0	27.8	39.74	.49	3	88.5	38.51	61.9	58.7	67.99	.87	1

38 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
68	30.7	27.5	39.75	.49	3	88.5	38.95	62.3	59.1	68.98	.87	1
69	30.3	27.2	39.75	.48	3	88.5	39.39	62.6	59.5	69.97	.87	1
70	29.9	26.9	39.76	.47	3	88.6	39.82	62.9	59.9	70.95	.88	1
71	29.5	26.5	39.76	.47	3	88.6	40.26	63.3	60.3	71.94	.88	1
72	29.2	26.2	39.77	.46	3	88.6	40.71	63.6	60.6	72.93	.88	1
73	28.8	25.9	39.77	.46	3	88.6	41.15	63.9	61.0	73.92	.88	1
74	28.5	25.6	39.78	.45	3	88.6	41.59	64.2	61.3	74.91	.89	1
75	28.2	25.3	39.78	.45	3	88.6	42.04	64.5	61.6	75.90	.89	1
76	27.8	25.0	39.79	.44	3	88.6	42.48	64.8	61.9	76.89	.89	1
77	27.5	24.8	39.79	.44	3	88.7	42.93	65.0	62.3	77.89	.89	1
78	27.2	24.5	39.80	.44	3	88.7	43.38	65.3	62.6	78.88	.90	1
79	26.9	24.2	39.80	.43	3	88.7	43.83	65.6	62.9	79.87	.90	1
80	26.6	23.9	39.81	.43	3	88.7	44.28	65.9	63.2	80.86	.90	1
81	26.3	23.7	39.81	.42	3	88.7	44.73	66.2	63.5	81.85	.90	1
82	26.1	23.4	39.82	.42	3	88.7	45.19	66.4	63.7	82.84	.91	1
83	25.8	23.1	39.82	.41	3	88.7	45.64	66.7	64.0	83.83	.91	1
84	25.5	22.9	39.82	.41	3	88.8	46.10	66.9	64.3	84.83	.91	1
85	25.2	22.7	39.83	.41	3	88.8	46.55	67.1	64.5	85.82	.91	1
86	25.0	22.4	39.83	.40	3	88.8	47.01	67.4	64.8	86.81	.91	1
87	24.7	22.2	39.83	.40	3	88.8	47.47	67.6	65.1	87.80	.91	1
88	24.5	22.0	39.84	.39	3	88.8	47.93	67.8	65.3	88.79	.92	1
89	24.2	21.8	39.84	.39	3	88.8	48.39	68.1	65.6	89.79	.92	1
90	24.0	21.6	39.84	.39	3	88.8	48.85	68.3	65.8	90.78	.92	1
91	23.8	21.3	39.85	.38	3	88.8	49.31	68.5	66.0	91.77	.92	1
92	23.5	21.1	39.85	.38	3	88.8	49.77	68.7	66.3	92.76	.92	1
93	23.3	20.9	39.85	.38	3	88.9	50.23	68.9	66.5	93.76	.92	1
94	23.1	20.7	39.86	.37	3	88.9	50.69	69.1	66.7	94.75	.93	1
95	22.9	20.5	39.86	.37	3	88.9	51.16	69.3	67.0	95.74	.93	1
96	22.6	20.3	39.86	.37	3	88.9	51.62	69.5	67.2	96.74	.93	1
97	22.4	20.1	39.86	.36	3	88.9	52.09	69.7	67.4	97.73	.93	1

	PINION					PINION AND GEAR		GEAR				
38 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
98	22.2	19.9	39.87	.36	3	88.9	52.55	69.9	676	98.72	.93	1
99	22.0	19.7	39.87	.36	3	88.9	53.02	70.1	67.8	99.72	.93	1
100	21.8	19.6	39.87	.35	3	88.9	53.49	70.3	68 0	100 71	.93	1
101	21.6	19.4	39.87	.35	3	88.9	53.96	70.5	68.2	101.70	.93	1
102	21.4	19.2	39.87	.35	3	88.9	54.42	70.6	68.4	102 70	.93	1
103	21.2	19 0	39.88	.34	3	89.0	54.89	70.8	68.6	103.69	94	1
104	21.1	18 9	39.88	.34	3	89.0	55.36	71.0	68.8	104.69	.94	1
105	20.9	18.7	39.88	.34	3	89.0	55.83	71.1	69 0	105.68	.94	1
106	20.7	18.5	39.88	.34	3	89 0	56.30	71.3	69.1	106.68	.94	1
107	20.5	18.4	39.88	.33	3	89.0	56.77	71.5	69.3	107.67	.94	1
108	20.3	18.2	39.89	.33	3	89.0	57.24	71.6	69.5	108 66	.94	1
109	20.2	18.1	39.89	.33	3	89 0	57.72	71.8	69.7	109 66	.94	1
110	20.0	17.9	39.89	.32	3	89 0	58.19	71.9	69.9	110 65	.94	1
111	19.8	17.8	39.89	.32	3	89 0	58.66	72.1	70.0	111.65	.94	1
112	19.6	17.6	39.89	.32	3	89 0	59.14	72.3	70.2	112 64	.94	1
113	19.5	17.5	39.90	.32	3	89 0	59.61	72.4	70 4	113.64	.95	1
114	19.3	17.3	39.90	.31	3	89 0	60.08	72.5	70 5	114 63	.95	1
115	19.2	17 2	39 90	.31	3	89.1	60.56	72.7	70 7	115.63	.95	1
116	19 0	17.0	39 90	.31	3	89.1	61 03	72.8	70 8	116 62	.95	1
117	18.9	16.9	39.90	.31	3	89.1	61.51	73 0	71.0	117 62	.95	1
118	18.7	16.8	39.90	.30	3	89.1	61.98	73 1	71.1	118 61	.95	1
119	18 6	16 6	39.90	.30	3	89.1	62.46	73 2	71.3	119 61	.95	1
120	18 4	16.5	39.91	.30	3	89 1	62.94	73.4	71 4	120 60	.95	1
121	18.3	16.4	39.91	.30	3	89.1	63.41	73.5	71.6	121.60	.95	1
122	18.1	16.3	39.91	.29	3	89.1	63.89	73.6	71.7	122.59	.95	1
123	18.0	16.1	39.91	.29	3	89 1	64.37	73.7	71.9	123.59	95	1
124	17 9	16.0	39.91	.29	3	89.1	64.85	73.9	72 0	124.59	.95	1
125	17.7	15.9	39.91	.29	3	89.1	65.32	74.0	72.1	125.58	.95	1
126	17.6	15.8	39.91	.29	3	89.1	65.80	74.1	72.3	126.58	.95	1
127	17.5	15.6	39.92	.28	3	89 1	66.28	74.2	72.4	127.57	.96	1

38 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
128	17.3	15.5	39 92	.28	3	89.1	66.76	74.3	72.5	128.57	.96	1
129	17.2	15.4	39.92	.28	3	89.1	67.24	74.5	72.6	129.57	.96	1
130	17.1	15 3	39.92	.28	3	89.2	67.72	74.6	72 8	130.56	.96	1
131	16.9	15.2	39.92	28	3	89 2	68.20	74.7	72.9	131.56	.96	1
132	16.8	15.1	39.92	.27	3	89.2	68.68	74.8	73.0	132.55	.96	1

39 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
39	47.1	43.8	40.41	.70	2	87.9	27.58					
40	46.3	43.1	40.43	.70	3	87.9	27.93	47.8	43.4	41.40	.71	2
41	45.6	42.4	40.45	.69	3	88.0	28.29	48.5	44.1	42.38	.72	2
42	44.9	41.7	40.47	.68	3	88.0	28.66	49.1	44.8	43.36	.73	2
43	44.2	41.1	40.48	.67	3	88.0	29.03	49.8	45.5	44.34	.74	2
44	43.5	40.4	40.50	.66	3	88.0	29.40	50.4	46.2	45.33	.75	2
45	42.8	39.8	40.51	.65	3	88.1	29.77	51.0	46.9	46.31	.75	2
46	42.2	39.2	40.53	.64	3	88.1	30.15	51.6	47.5	47.29	.76	2
47	41.5	38.6	40.54	.64	3	88.1	30.54	52.2	48.1	48.28	.77	2
48	40.9	38.0	40.55	.63	3	88.1	30.92	52.8	48.8	49.26	.77	2
49	40.3	37.5	40.56	.62	3	88.2	31.31	53.3	49.4	50.24	.78	2
50	39.7	36.9	40.58	.61	3	88.2	31.70	53.8	50.0	51.23	.79	2
51	39.2	36.4	40.59	.60	3	88.2	32.10	54.4	50.6	52.21	.79	2
52	38.6	35.9	40.60	.60	3	88.2	32.50	54.9	51.1	53.20	.80	2
53	38.1	35.3	40.61	.59	3	88.3	32.90	55.4	51.7	54.18	.80	2
54	37.5	34.9	40.62	.58	3	88.3	33.30	55.9	52.2	55.17	.81	2
55	37.0	34.4	40.63	.58	3	88.3	33.71	56.4	52.7	56.16	.81	2
56	36.5	33.9	40.64	.57	3	88.3	34.12	56.8	53.2	57.14	.82	2
57	36.0	33.4	40.65	.56	3	88.3	34.53	57.3	53.7	58.13	.82	2
58	35.5	33.0	40.66	.56	3	88.4	34.95	57.7	54.2	59.12	.83	2
59	35.1	32.5	40.67	.55	3	88.4	35.36	58.1	54.7	60.10	.83	2
60	34.6	32.1	40.68	.54	3	88.4	35.78	58.6	55.1	61.09	.84	2
61	34.2	31.7	40.69	.54	3	88.4	36.20	59.0	55.6	62.08	.84	2
62	33.7	31.3	40.69	.53	3	88.4	36.62	59.4	56.0	63.07	.84	2
63	33.3	30.9	40.70	.52	3	88.4	37.05	59.8	56.5	64.05	.85	2
64	32.9	30.5	40.71	.52	3	88.5	37.47	60.2	56.9	65.04	.85	2
65	32.5	30.1	40.72	.51	3	88.5	37.90	60.5	57.3	66.03	.86	2
66	32.1	29.7	40.72	.51	3	88.5	38.33	60.9	57.7	67.02	.86	2
67	31.7	29.3	40.73	.50	3	88.5	38.76	61.3	58.1	68.01	.86	2
68	31.3	29.0	40.74	.50	3	88.5	39.19	61.6	58.5	69.00	.87	1

39 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
69	30.9	27.8	40.74	.49	3	88.5	39.63	62.0	58.8	69.99	.87	1
70	30.5	27.5	40.75	.48	3	88.6	40.06	62.3	59.3	70.97	.87	1
71	30.1	27.2	40.76	.48	3	88.6	40.50	62.6	59.6	71.96	.88	1
72	29.8	26.9	40.76	.47	3	88.6	40.94	63.0	60.0	72.95	.88	1
73	29.4	26.5	40.76	.47	3	88 6	41.38	63.3	60.4	73.94	.88	1
74	29.1	26.2	40.77	.46	3	88.6	41.82	63.6	60.7	74.93	.88	1
75	28.8	25.9	40.78	.46	3	88.6	42.27	63.9	61.0	75.92	.89	1
76	28.4	25.6	40.78	.45	3	88.7	42.71	64.2	61.4	76.91	.89	1
77	28.1	25.3	40.78	.45	3	88.7	43.16	64.5	61.7	77.90	.89	1
78	27.8	25.1	40.79	.44	3	88.7	43.60	64.8	62.0	78.89	.89	1
79	27.5	24.8	40.79	.44	3	88.7	44.05	65.0	62.3	79.89	.89	1
80	27.2	24.5	40.80	.44	3	88.7	44.50	65.3	62.6	80.88	.90	1
81	26.9	24.2	40.80	.43	3	88.7	44.95	65.6	62.9	81.87	.90	1
82	26.6	24.0	40.81	.43	3	88.7	45.40	65.8	63.2	82.86	.90	1
83	26.4	23.7	40.81	.42	3	88.7	45.85	66.1	63.4	83.85	.90	1
84	26.1	23.5	40.82	.42	3	888	46.31	66.3	63.7	84.84	.91	1
85	25.8	23.2	40.82	.41	3	88.8	46.76	66.6	64.0	85.83	.91	1
86	25.5	23.0	40.82	.41	3	88.8	47.22	66.8	64.2	86.83	.91	1
87	25.3	22.8	40.83	.41	3	88.8	47.67	67.1	64.5	87.82	.91	1
88	25.0	22.5	40.83	.40	3	88.8	48.13	67.3	64.8	88.81	.91	1
89	24.8	22.3	40.83	.40	3	88.8	48.58	67.5	65.0	89.80	.91	1
90	24.5	23.1	40.84	.40	3	88.8	49.04	67.7	65.3	90.80	.91	1
91	24.3	21.9	40.84	.39	3	888	49.50	68.0	65.5	91.79	.92	1
92	24.1	21.7	40.84	.39	3	88.8	49.96	68.2	65.8	92.78	.92	1
93	23.8	21.5	40.85	.38	3	88.9	50.42	68.4	66.0	93.77	.92	1
94	23.6	21.2	40.85	.38	3	88.9	50.88	68.6	66.2	94.77	.92	1
95	23.4	21.0	40.85	.38	3	88.9	51.35	68.8	66.4	95.76	.92	1
96	23.2	20.8	40.85	.37	3	88.9	51.81	69.0	66.7	96.75	.92	1
97	23.0	20.6	40.86	.37	3	88.9	52.27	69.2	66.9	97.74	.93	1
98	22.8	20.5	40.86	.37	3	88.9	52.74	69.4	67.1	98.74	.93	1

39 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
99	22.5	20.3	40.86	.36	3	88.9	53.20	69.6	67.3	99.73	.93	1
100	22.3	20.1	40.86	.36	3	88.9	53.67	69.8	67.5	100.73	.93	1
101	22.1	19.9	40.87	.36	3	88.9	54.13	70.0	67.7	101.72	.93	1
102	21.9	19.7	40.87	.35	3	88.9	54.60	70.1	67.9	102.71	.93	1
103	21.7	19.5	40.87	.35	3	89.0	55.07	70.3	68.1	103.71	.93	1
104	21.5	19.4	40.87	.35	3	89.0	55.54	70.5	68.3	104.70	.93	1
105	21.3	19.2	40.88	.35	3	89.0	56.00	70.7	68.5	105.70	.94	1
106	21.2	19.0	40.88	.34	3	89.0	56.47	70.8	68.7	106.69	.94	1
107	21.0	18.8	40.88	.34	3	89.0	56.94	71.0	68.8	107.68	.94	1
108	20.8	18.7	40.88	.34	3	89.0	57.41	71.2	69.0	108.68	.94	1
109	20.6	18.5	40.88	.33	3	89.0	57.88	71.3	69.2	109.67	.94	1
110	20.4	18.4	40.88	.33	3	89.0	58.35	71.5	69.4	110.67	.94	1
111	20.3	18.2	40.89	.33	3	89.0	58.83	71.6	69.6	111.66	.94	1
112	20.1	18.1	40.89	.33	3	89.0	59.30	71.8	69.7	112.66	.94	1
113	19.9	17.9	40.89	.32	3	89.0	59.77	71.9	69.9	113.65	.94	1
114	19.8	17.8	40.89	.32	3	89.0	60.29	72.1	70.1	114.65	.94	1
115	19.6	17.6	40.89	.32	3	89.1	60.72	72.2	70.2	115.64	.94	1
116	19.5	17.5	40.90	.32	3	89.1	61.19	72.4	70.4	116.64	.95	1
117	19.3	17.4	40.90	.31	3	89.1	61.66	72.5	70.5	117.63	.95	1
118	19.2	17.2	40.90	.31	3	89.1	62.14	72.7	70.7	118.63	.95	1
119	19.0	17.1	40.90	.31	3	89.1	62.61	72.8	70.9	119.62	.95	1
120	18.9	17.0	40.90	.31	3	89.1	63.09	72.9	71.0	120.62	.95	1
121	18.7	16.8	40.90	.30	3	89.1	63.56	73.1	71.1	121.61	.95	1
122	18.6	16.7	40.90	.30	3	89.1	64.04	73.2	71.3	122.61	.95	1
123	18.4	16.6	40.91	.30	3	89.1	64.52	73.3	71.4	123.60	.95	1
124	18.3	16.4	40.91	.30	3	89.1	65.00	73.4	71.6	124.60	.95	1
125	18.1	16.3	40.91	.30	3	89.1	65.47	73.6	71.7	125.60	.95	1
126	18.0	16.2	40.91	.29	3	89.1	65.95	73.7	71.8	126.59	.95	1
127	17.9	16.1	40.91	.29	3	89.1	66.43	73.8	72.0	127.59	.95	1
128	17.7	16.0	40.91	.29	3	89.1	66.90	73.9	72.1	128.58	.95	1

39 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
129	17.6	15.8	40.91	.29	3	89.1	67.38	74.0	72.3	129.58	.95	1
130	17.5	15.7	40.91	.28	3	89.2	67.86	74.2	72.4	130.57	.95	1
131	17.4	15.6	40.92	.28	3	89.2	68.34	74.3	72.5	131.57	.96	1
132	17.2	15.5	40.92	.28	3	89.2	68.82	74.4	72.6	132.57	.96	1

	PINION					PINION AND GEAR		GEAR				
40 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH DIVIDE BY PITCH	NO. OF CUTTER TO USE
40	47.0	42.6	41.41	.70	2	88.0	28.28					
41	46.3	42.0	41.43	.70	2	88.0	28.64	47.7	43.4	42.40	.71	2
42	45.6	41.3	41.45	.69	2	88.0	29.00	48.3	44.1	43.38	72	2
43	44.9	40.7	41.46	.68	3	88.0	29.36	49.0	44.8	44.36	.73	2
44	44.2	40.0	41.48	.67	3	88.1	29.73	49.6	45.5	45.34	.74	2
45	43.5	39.4	41.50	.66	3	88.1	30.10	50.2	46.2	46.33	.75	2
46	42.9	38.9	41.51	.65	3	88.1	30.48	50.9	46.8	47.31	.75	2
47	42.2	38.3	41.52	.64	3	88.1	30.86	51.4	47.5	48.29	.76	2
48	41.6	37.7	41.54	.64	3	88.2	31.24	52.0	48.1	49.28	.77	2
49	41.0	37.1	41.55	.63	3	88.2	31.63	52.6	48.7	50.26	.77	2
50	444	36.6	41.56	.62	3	88.2	32.02	53.1	49.3	51.25	.78	2
51	39.9	36.1	41.57	.61	3	88.2	32.41	53.6	49.9	52.23	.78	2
52	39.3	35.6	41.59	.61	3	88.2	32.80	54.2	50.4	53.22	.79	2
53	38.8	35.1	41.60	.60	3	88.3	33.20	54.8	51.0	54.20	.80	2
54	38.2	34.6	41.61	.59	3	88.3	33.60	55.2	51.5	55.19	.80	2
55	37.7	34.1	41.62	.59	3	88.3	34.00	55.6	52.0	56.18	.81	2
56	37.2	33.6	41.63	.58	3	88.3	34.41	56.1	52.5	57.16	.81	2
57	36.7	33.2	41.64	.57	3	88.4	34.82	56.6	53.0	58.15	.82	2
58	36.2	32.7	41.65	.57	3	88.4	35.23	57.0	53.5	59.14	.82	2
59	35.7	32.3	41.66	.56	3	88.4	35.64	57.5	54.0	60.12	.83	2
60	35.3	31.9	41.67	.55	3	88.4	36.06	57.9	54.5	61.11	.83	2
61	34.8	31.5	41.67	55	3	88.4	36.47	58.3	54.9	62.10	.83	2
62	34.4	31.1	41.68	.54	3	88.4	36.89	58.7	55.4	63.08	.84	2
63	34.0	30.7	41.69	.53	3	88.5	37.31	59.1	55.8	64.07	.84	2
64	33.5	30.3	41.70	.53	3	88.5	37.74	59.5	56.3	65.06	.85	2
65	33.1	29.9	41.70	.52	3	88.5	38.16	59.9	56.7	66.05	.85	2
66	32.7	29.5	41.71	.52	3	88.5	38.59	60.3	57.1	67.09	.85	2
67	32.3	29.1	41.72	.51	3	88.5	39.01	60.6	57.5	68.03	.86	2
68	31.9	28.8	41.73	.50	3	88.5	39.45	61.0	57.9	69.01	86	1
69	31.5	28.5	41.73	.50	3	88.6	39.88	61.3	58.2	70.00	86	1

40 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
70	31.1	28.2	41.74	.49	3	88.6	40.31	61.6	58.6	70.99	.87	1
71	30.8	27.8	41.74	.49	3	88.6	40.75	62 0	59 0	71.98	87	1
72	30.4	27.5	41.75	.48	3	88.6	41.18	62 3	59 4	72 97	.87	1
73	30.1	27.2	41.76	.48	3	88.6	41.62	62 6	59 7	73.96	.88	1
74	29.7	26.9	41.76	.47	3	88.6	42.06	63.0	60.0	74.95	.88	1
75	29.4	26.6	41.77	.47	3	88.6	42.50	63.3	60 4	75.94	.88	1
76	29 0	26.3	41.77	.46	3	88.7	42.94	63 6	60 7	76 93	.88	1
77	28.7	26.0	41.78	.46	3	88.7	43.38	63.9	61 0	77.92	.89	1
78	28.4	25.7	41.78	.45	3	88 7	43.83	64.1	61 4	78 91	89	1
79	28.1	25.4	41.78	.45	3	88 7	44.28	64 4	61.7	79 90	.89	1
80	27.8	25.1	41.79	.44	3	88.7	44.72	64 7	62 0	80.89	89	1
81	27 5	24.9	41.79	.44	3	88.7	45.17	65.0	62 3	81 89	89	1
82	27.2	24 6	41.80	44	3	88.7	45.62	65.2	62 6	82 88	90	1
83	26 9	24 3	41.80	.43	3	88.8	46.07	65.5	62 9	83.87	90	1
84	26.6	24.1	41 81	.43	3	88.8	46.52	65.8	63 2	84 86	90	1
85	26.4	23.8	41.81	.42	3	88.8	46.97	66 0	63.4	85 85	.90	1
86	26.1	23.6	41.81	.42	3	88.8	47.42	66 2	63.7	86 84	.90	1
87	25.8	23.3	41 82	.42	3	88.8	47 88	66 5	64 0	87 84	.91	1
88	25 6	23.1	41 82	.41	3	88.8	48 33	66 7	64.2	88 83	.91	1
89	25.3	22 9	41 83	41	3	88.8	48.79	67.0	64 5	89.82	.91	1
90	25.1	22.6	41.83	.40	3	88 8	49.24	67 2	64 7	90.81	.91	1
91	24 8	22.4	41.83	.40	3	88 8	49 70	67 4	65 0	91 81	.91	1
92	24.6	22.2	41 83	.40	3	88 9	50 16	67 6	65.2	92 80	91	1
93	24.3	22 0	41.84	39	3	88 9	50 62	67 9	65 5	93 79	.92	1
94	24.1	21 8	41 84	.39	3	88.9	51 08	68.1	65.7	94 78	92	1
95	23 9	21.6	41 84	39	3	88.9	51 54	68.3	65.9	95 78	.92	1
96	23.7	21.4	41 85	.38	3	88 9	52 00	68.5	66 1	96 77	.92	1
97	23 5	21 2	41 85	38	3	88 9	52 46	68.7	66 4	97 76	.92	1
98	23.3	21 0	41 85	.38	3	88 9	52 92	68.9	66.6	98.76	92	1
99	23.0	20 8	41 86	.37	3	88.9	53 39	69.1	66 8	99.75	.93	1

40 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
100	22.8	20.6	41.86	.37	3	88.9	53.85	69.3	67.0	100.74	.93	1
101	22.6	20.4	41.86	.37	3	88.9	54.32	69.5	67.2	101.74	.93	1
102	22.4	20.2	41.86	.36	3	89.0	54.78	69.6	67.4	102.73	.93	1
103	22.2	20.0	41.87	.36	3	89.0	55.25	69.8	67.6	103.72	.93	1
104	22.0	19.9	41.87	.36	3	89.0	55.71	70.0	67.8	104.72	.93	1
105	21.8	19.7	41.87	.35	3	89.0	56.18	70.2	68.0	105.71	.93	1
106	21.7	19.5	41.87	.35	3	89.0	56.65	70.3	68.2	106.71	.93	1
107	21.5	19.3	41.87	.35	3	89.0	57.12	70.5	68.4	107.70	.93	1
108	21.3	19.2	41.88	.34	3	89.0	57.58	70.7	68.6	108.69	.94	1
109	21.1	19.0	41.88	.34	3	89.0	58.05	70.8	68.8	109.69	.94	1
110	20.9	18.8	41.88	.34	3	89.0	58.52	71.0	68.9	110.68	.94	1
111	20.7	18.7	41.88	.34	3	89.0	58.99	71.2	69.1	111.68	.94	1
112	20.6	18.5	41.88	.33	3	89.0	59.46	71.3	69.3	112.67	.94	1
113	20.4	18.4	41.89	.33	3	89.0	59.93	71.5	69.5	113.67	.94	1
114	20.2	18.3	41.89	.33	3	89.0	60.41	71.6	69.6	114.66	.94	1
115	20.1	18.1	41.89	.33	3	89.1	60.88	71.8	69.8	115.66	.94	1
116	19.9	17.9	41.89	.32	3	89.1	61.35	71.9	69.9	116.65	.94	1
117	19.8	17.8	41.89	.32	3	89.1	61.82	72.1	70.1	117.65	.94	1
118	19.6	17.7	41.89	.32	3	89.1	62.30	72.2	70.2	118.64	.94	1
119	19.4	17.5	41.90	.32	3	89.1	62.77	72.4	70.4	119.64	.95	1
120	19.3	17.4	41.90	.31	3	89.1	63.24	72.5	70.6	120.63	.95	1
121	19.1	17.2	41.90	.31	3	89.1	63.72	72.6	70.7	121.63	.95	1
122	19.0	17.1	41.90	.31	3	89.1	64.19	72.8	70.9	122.62	.95	1
123	18.9	17.0	41.90	.31	3	89.1	64.67	72.9	71.0	123.62	.95	1
124	18.7	16.9	41.90	.30	3	89.1	65.14	73.0	71.2	124.61	.95	1
125	18.6	16.7	41.90	.30	3	89.1	65.62	73.1	71.3	125.61	.95	1
126	18.5	16.6	41.91	.30	3	89.1	66.10	73.3	71.4	126.60	.95	1
127	18.3	16.5	41.91	.30	3	89.1	66.58	73.4	71.6	127.60	.95	1
128	18.2	16.3	41.91	.30	3	89.1	67.05	73.5	71.7	128.60	.95	1
129	18.0	16.2	41.91	.29	3	89.1	67.53	73.6	71.8	129.59	.95	1

40 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
130	17.9	16.1	41.91	.29	3	89.2	68.01	73.7	72.0	130.59	.95	1
131	17.8	16.0	41.91	.29	3	89.2	68.48	73.9	72.1	131.58	.95	1
132	17.6	15.9	41.91	.29	3	89.2	68.96	74.0	72.2	132.58	.95	1

	PINION					PINION AND GEAR		GEAR				
41 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
41	47.0	42.7	42.41	.70	2	88.0	28.99					
42	46.3	42.0	42.43	.70	2	88.0	29.35	47.7	43.5	43.40	.71	2
43	45.6	41.4	42.45	.69	2	88.1	29.71	48.3	44.1	44.38	.72	2
44	44.9	40.8	42.46	.68	2	88.1	30.07	48.9	44.8	45.36	.73	2
45	44.2	40.2	42.48	.67	2	88.1	30.44	49.5	45.5	46.35	.74	2
46	43.6	39.6	42.49	.66	2	88.1	30.81	50.1	46.2	47.33	.74	2
47	42.9	39.0	42.51	.65	3	88.2	31.18	50.7	46.8	48.31	.75	2
48	42.3	38.4	42.52	.65	3	88.2	31.56	51.3	47.4	49.30	.76	2
49	41.7	37.9	42.53	.64	3	88.2	31.94	51.9	48.0	50.28	.76	2
50	41.1	37.3	42.55	.63	3	88.2	32.33	52.4	48.6	51.27	.77	2
51	40.5	36.8	42.56	.62	3	88.2	32.72	53.0	49.2	52.25	.78	2
52	40.0	36.3	42.57	.62	3	88.3	33.11	53.5	49.8	53.24	.78	2
53	39.4	35.8	42.58	.61	3	88.3	33.50	54.0	50.3	54.22	.79	2
54	38.9	35.3	42.59	.60	3	88.3	33.90	54.5	50.9	55.21	.79	2
55	38.4	34.8	42.60	.59	3	88.3	34.30	55.0	51.4	56.19	.80	2
56	37.9	34.3	42.62	.59	3	88.3	34.70	55.4	51.9	57.18	.81	2
57	37.3	33.9	42.63	.58	3	88.4	35.11	55.9	52.4	58.17	.81	2
58	36.9	33.4	42.64	.57	3	88.4	35.51	56.4	52.9	59.15	.82	2
59	36.4	33.0	42.64	.57	3	88.4	35.92	56.8	53.4	60.14	.82	2
60	35.9	32.5	42.65	.56	3	88.4	36.33	57.2	53.8	61.13	.82	2
61	35.5	32.1	42.66	.55	3	88.4	36.75	57.6	54.3	62.11	.83	2
62	35.0	31.7	42.67	.55	3	88.5	37.17	58.0	54.7	63.10	.83	2
63	34.6	31.3	42.68	.54	3	88.5	37.58	58.4	55.2	64.09	.84	2
64	34.1	30.9	42.69	.54	3	88.5	38.00	58.8	55.6	65.08	.84	2
65	33.7	30.5	42.69	.53	3	88.5	38.42	59.2	56.0	66.07	.84	2
66	33.3	30.1	42.70	.53	3	88.5	38.85	59.6	56.5	67.06	.85	2
67	32.9	29.8	42.71	.52	3	88.5	39.27	60.0	56.8	68.04	.85	2
68	32.5	29.4	42.71	.51	3	88.6	39.70	60.4	57.2	69.03	.85	2
69	32.1	29.1	42.72	.51	3	88.6	40.13	60.7	57.6	70.02	.86	1
70	31.7	28.8	42.73	.50	3	88.6	40.56	61.0	58.0	71.01	.86	1

41	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
71	31 4	28.4	42 73	.50	3	88 6	40.99	61 4	58 4	72.00	86	1
72	31.0	28.1	4274	.49	3	88 6	41 43	61.7	58.8	72.99	.87	1
73	30.7	278	42.75	49	3	88.6	4186	62.0	59 1	73.98	87	1
74	30.3	27 5	42.75	.48	3	88.6	42.30	62.4	59.5	74.97	87	1
75	30.0	27 1	42 76	48	3	88.7	42.74	62 7	59 8	75.96	88	1
76	29.6	26 8	42 76	.47	3	88.7	43.18	63.0	60 1	76 95	88	1
77	29.3	26.6	42 77	.47	3	88.7	43.62	63.3	60.5	77 94	88	1
78	29 0	26.3	42 77	.46	3	88.7	44.06	63.5	60.8	78 93	88	1
79	28 7	26 0	42.78	.46	3	88.7	4450	63.8	61.1	7992	89	1
80	28.4	25.7	42 78	.45	3	88.7	4495	64.1	61 4	80 91	89	1
81	28.1	25.4	42.78	45	3	88.7	45 39	64 4	61 7	81.90	.89	1
82	27 8	25.1	42.79	.44	3	88.7	45 84	64.7	62.0	82 89	89	1
83	27 5	24 9	42 79	44	3	88.8	46.29	65.0	62.3	83 89	89	1
84	27.2	24.6	42 80	.44	3	88.8	46.74	65.2	62 6	84 88	90	1
85	26 9	24 4	42 80	.43	3	88 8	47.19	65.5	62.9	85.87	90	1
86	26 7	24.1	42 81	.43	3	88 8	47.64	65 7	63 1	86.86	90	1
87	26.4	23.9	42 81	42	3	88 8	48 09	66.0	63.4	8785	90	1
88	26 1	23 6	42 81	.42	3	88 8	48.54	66.2	63.7	88 85	90	1
89	25 9	23.4	4282	42	3	88 8	48 99	66.4	63.9	89.84	91	1
90	25 6	23 2	42 82	.41	3	88 8	49.45	66.7	64.2	90.83	91	1
91	25.4	23 0	42 83	.41	3	88 8	49 90	66.9	64 4	91.82	91	1
92	25 1	22.7	42 83	41	3	88 9	50 36	67 1	64.7	92.82	.91	1
93	24.9	22.5	42 83	.40	3	88 9	50.82	67 3	64.9	93 81	91	1
94	24 7	22.3	42.83	.40	3	88 9	51.28	67 5	65.2	94.80	91	1
95	24.4	22.1	42 84	.39	3	88.9	51 73	67 7	65.4	95.79	92	1
96	24.2	21 9	42 84	.39	3	88.9	52.19	67 9	65 6	96.79	92	1
97	24 0	21 7	42 84	39	3	88.9	52.65	68.2	65.9	97.78	92	1
98	23.8	21.5	42 85	.38	3	88.9	53.11	68.4	66.1	98 77	.92	1
99	23.5	21.3	42 85	.38	3	88.9	53.58	68.6	66.3	99 77	92	1
100	23 3	21.1	42 85	.38	3	88 9	54.04	68 8	66.5	100 76	.92	1

41 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
101	23.1	20.9	42.85	.37	3	88.9	54.50	69.0	66.7	101.75	.92	1
102	22.9	20.7	42.86	.37	3	89.0	54.96	69.1	66.9	102.75	.93	1
103	22.7	20.5	42.86	.37	3	89.0	55.43	69.3	67.1	103.74	.93	1
104	22.5	20.3	42.86	.36	3	89.0	55.89	69.5	67.3	104.73	.93	1
105	22.3	20.2	42.86	.36	3	89.0	56.36	69.7	67.5	105.73	.93	1
106	22.1	20.0	42.87	.36	3	89.0	56.82	69.9	67.7	106.72	.93	1
107	21.9	19.8	42.87	.35	3	89.0	57.29	70.0	67.9	107.71	.93	1
108	21.8	19.7	42.87	.35	3	89.0	57.76	70.2	68.1	108.71	.93	1
109	21.6	19.5	42.87	.35	3	89.0	58.23	70.4	68.3	109.70	.93	1
110	21.4	19.3	42.87	.35	3	89.0	58.70	70.5	68.5	110.70	.93	1
111	21.2	19.2	42.88	.34	3	89.0	59.17	70.7	68.6	111.69	.94	1
112	21.0	19.0	42.88	.34	3	89.0	59.63	70.9	68.8	112.69	.94	1
113	20.9	18.9	42.88	.34	3	89.0	60.10	71.0	69.0	113.68	.94	1
114	20.7	18.7	42.88	.34	3	89.1	60.57	71.2	69.2	114.68	.94	1
115	20.5	18.6	42.88	.33	3	89.1	61.04	71.3	69.3	115.67	.94	1
116	20.4	18.4	42.89	.33	3	89.1	61.52	71.5	69.5	116.67	.94	1
117	20.2	18.3	42.89	.33	3	89.1	61.99	71.6	69.6	117.66	.94	1
118	20.0	18.1	42.89	.33	3	89.1	62.46	71.8	69.8	118.66	.94	1
119	19.9	18.0	42.89	.32	3	89.1	62.93	71.9	70.0	119.65	.94	1
120	19.7	17.8	42.89	.32	3	89.1	63.40	72.0	70.1	120.65	.94	1
121	19.6	17.7	42.89	.32	3	89.1	63.88	72.2	70.3	121.64	.94	1
122	19.4	17.5	42.90	.32	3	89.1	64.35	72.3	70.4	122.64	.95	1
123	19.3	17.4	42.90	.31	3	89.1	64.83	72.5	70.6	123.63	.95	1
124	19.1	17.3	42.90	.31	3	89.1	65.30	72.6	70.7	124.63	.95	1
125	19.0	17.2	42.90	.31	3	89.1	65.78	72.7	70.9	125.62	.95	1
126	18.9	17.0	42.90	.31	3	89.1	66.25	72.8	71.0	126.62	.95	1
127	18.7	16.9	42.90	.30	3	89.1	66.73	73.0	71.1	127.61	.95	1
128	18.6	16.8	42.90	.30	3	89.1	67.20	73.1	71.3	128.61	.95	1
129	18.4	16.7	42.91	.30	3	89.2	67.68	73.2	71.4	129.61	.95	1
130	18.3	16.6	42.91	.30	3	89.2	68.16	73.3	71.5	130.60	.95	1

41 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
131	18.2	16.4	42.91	.30	3	89.2	68.63	73.5	71.7	131.60	.95	1
132	18.1	16.3	42.91	.29	3	89.2	69.11	73.6	71.8	132.59	.95	1

42 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
42	46.9	42.8	43.41	.70	2	88.1	29.70					
43	46.2	42.1	43.43	.70	2	88.1	30.05	47.6	43.5	44.40	.71	2
44	45.5	41.5	43.45	.69	2	88.1	30.41	48.2	44.2	45.38	.72	2
45	44.9	40.9	43.46	.68	2	88.1	30.77	48.8	44.8	46.36	.73	2
46	44.2	40.3	43.48	.67	2	88.2	31.14	49.4	45.5	47.35	.74	2
47	43 6	39.7	43.49	.66	2	88 2	31.51	50.0	46.1	48.33	.74	2
48	43 0	39.1	43.51	.66	2	88.2	31.89	50.6	46.8	49.32	.75	2
49	42.4	38.5	43.52	.65	2	88.2	32.27	51.2	47.4	50.30	.76	2
50	41.8	38.0	43.53	.64	2	88.2	32.65	51.7	48 0	51.29	.76	2
51	41.2	37.5	43.54	.63	3	88.3	33.03	52.2	48 5	52.27	.77	2
52	40.6	36 9	43.55	.63	3	88.3	33.42	52 8	49.1	53.26	.77	2
53	40.1	36.4	43.57	.62	3	88.3	33.81	53.3	49.6	54.24	78	2
54	39.5	35.9	43.58	.61	3	88 3	34.20	53 8	50.2	55.23	.79	2
55	39 0	35.5	43.59	.60	3	88.3	34.60	54.3	50.7	56.21	.79	2
56	38.5	35.0	43.60	.60	3	88.4	35.00	54.8	51.2	57.20	.80	2
57	38.0	34.5	43.61	.59	3	88.4	35.40	55.2	51.8	58.19	80	2
58	37.5	34.0	43.62	.58	3	88.4	35.80	55.7	52.3	59.17	.81	2
59	37.0	33.6	43 63	.58	3	88.4	36.21	56.1	52.7	60.16	.81	2
60	36.5	33.2	43 64	57	3	88.4	36.62	56.6	53.2	61.15	.82	2
61	36.1	32.8	43.65	.56	3	88.4	37.03	57.0	53.7	62.13	82	2
62	35.6	32 3	43 66	.56	3	88 5	37.44	57 4	54.1	63.12	.83	2
63	35.2	32.0	43 67	.55	3	88.5	37.86	57.8	54 6	64.11	.83	2
64	34.8	31 5	43 67	.55	3	88.5	38.27	58.2	55.0	65.10	.83	2
65	34.4	31.2	43 68	.54	3	88.5	38.69	58.6	55.4	66.09	.84	2
66	33 9	30 8	43 69	.53	3	88 5	39.11	59 0	55.8	67 07	84	2
67	33 5	30 4	43.70	.53	3	88.5	39.54	59 4	56.2	68.06	.85	2
68	33.1	30 0	43.70	.52	3	88 6	39.96	59.7	56.6	69 05	.85	2
69	32 8	29.7	43.71	.52	3	88 6	40.39	60.1	57.0	70 04	85	2
70	32 3	29.4	43 72	.51	3	88.6	40.82	60.4	57.4	71.03	.86	1
71	31.9	29.0	43.72	.51	3	88.6	41.25	60.8	57.8	72.02	.86	1

42 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
72	31.6	28.7	43.73	.50	3	88.6	41.68	61.1	58.2	73.01	86	1
73	31.2	28.4	43.73	.50	3	88.6	42.11	61.4	58.5	74.00	.86	1
74	30.9	28.0	43.74	.49	3	88.6	42.54	61.8	58.9	74.99	.87	1
75	30.5	27.7	43.75	.49	3	88.7	42.98	62.1	59.2	75.98	.87	1
76	30.2	27.4	43.75	.48	3	88.7	43.42	62.4	59.6	76.97	.87	1
77	29.9	27.1	43.76	.48	3	88.7	43.85	62.7	59.9	77.96	.88	1
78	29.5	26.8	43.76	.47	3	88.7	44.29	63.0	60.2	78.95	.88	1
79	29.2	26.5	43.77	.47	3	88.7	44.73	63.3	60.6	79.94	.88	1
80	28.9	26.2	43.77	.46	3	88.7	45.18	63.6	60.9	80.93	.88	1
81	28.6	26.0	43.78	.46	3	88.7	45.62	63.8	61.2	81.92	.89	1
82	28.3	25.7	43.78	.45	3	88.8	46.07	64.1	61.5	82.91	.89	1
83	28.0	25.4	43.78	.45	3	88.8	46.51	64.4	61.8	83.90	.89	1
84	27.7	25.2	43.79	.44	3	88.8	46.96	64.6	62.1	84.89	.89	1
85	27.5	24.9	43.79	.44	3	88.8	47.40	64.9	62.4	85.89	.89	1
86	27.2	24.7	43.80	.44	3	88.8	47.85	65.2	62.6	86.88	.90	1
87	26.9	24.4	43.80	.43	3	88.8	48.30	65.4	62.9	87.87	.90	1
88	26.6	24.2	43.80	.43	3	88.8	48.75	65.7	63.2	88.86	.90	1
89	26.4	23.9	43.81	.42	3	88.8	49.20	65.9	63.5	89.85	.90	1
90	26.1	23.7	43.81	.42	3	88.8	49.66	66.1	63.7	90.85	.90	1
91	25.9	23.5	43.82	.42	3	88.9	50.11	66.4	64.0	91.84	.91	1
92	25.6	23.2	43.82	.41	3	88.9	50.57	66.6	64.2	92.83	.91	1
93	25.4	23.0	43.82	.41	3	88.9	51.02	66.8	64.4	93.82	.91	1
94	25.1	22.8	43.83	.41	3	88.9	51.48	67.0	64.7	94.82	.91	1
95	24.9	22.6	43.83	.40	3	88.9	51.93	67.3	64.9	95.81	.91	1
96	24.7	22.4	43.83	.40	3	88.9	52.39	67.5	65.1	96.80	.91	1
97	24.5	22.2	43.84	.40	3	88.9	52.85	67.7	65.4	97.80	.92	1
98	24.2	22.0	43.84	.39	3	88.9	53.31	67.9	65.6	98.79	.92	1
99	24.0	21.8	43.84	.39	3	88.9	53.77	68.1	65.8	99.78	.92	1
100	23.8	21.6	43.84	.39	3	88.9	54.23	68.3	66.0	100.78	.92	1
101	23.6	21.4	43.85	.38	3	88.9	54.69	68.5	66.2	101.77	.92	1

42 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK. ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
102	23.4	21.2	43 85	.38	3	89 0	55.15	68.7	66.5	102.76	92	1
103	23:2	21.0	43.85	.37	3	89 0	55.62	68 8	66.7	103.75	.92	1
104	23.0	20.8	43.86	.37	3	89.0	56.08	69.0	66 9	104.75	.93	1
105	22.8	20.6	43.86	.37	3	89.0	56.59	69.2	67.1	105.74	93	1
106	22.6	20.5	43.86	.37	3	89 0	57.01	69.4	67.3	106.74	.93	1
107	22.4	20.3	43.86	.36	3	89 0	57.47	69 5	67.4	107.73	.93	1
108	22.2	20.1	43.86	.36	3	89.0	57.94	69.7	67.6	108 72	.93	1
109	22:0	20.0	43.87	.36	3	89.0	58.40	69 9	67.8	109.72	.93	1
110	21.8	19.8	43.87	.35	3	89.0	58.87	70.1	68 0	110.71	.93	1
111	21.7	19.6	43.87	.35	3	89.0	59.34	70.2	68.2	111.71	.93	1
112	21.5	19.4	43.87	.35	3	89.0	59.81	70.4	68.4	112.70	.93	1
113	21.3	19.3	43.87	.35	3	89.0	60.28	70.6	68.5	113.70	.93	1
114	21.1	19.1	43.88	.34	3	89.1	60.75	70.7	68.7	114.69	.94	1
115	21.0	19.0	43.88	.34	3	89.1	61 21	70.9	68.9	115.69	.94	1
116	20.8	18.8	43.88	.34	3	89.1	61.68	71.0	69.0	116.68	.94	1
117	20.6	18.7	43.88	.34	3	89.1	62.15	71.2	69.2	117.68	.94	1
118	20.5	18.5	43.88	.33	3	89.1	62.63	71.3	69.4	118.67	.94	1
119	20.3	18.4	43.89	.33	3	89.1	63.10	71.5	69.5	119.66	.94	1
120	20.2	18.2	43.89	.33	3	89.1	63.57	71.6	69.7	120.66	.94	1
121	20.0	18.1	43.89	.32	3	89.1	64.09	71.8	69.9	121.65	.94	1
122	19.9	18.0	43.89	.32	3	89.1	64 51	71.9	70.0	122.65	.94	1
123	19.7	17.8	43.89	.32	3	89.1	64.99	72.0	70.1	123.64	.94	1
124	19.5	17.7	43.89	.32	3	89.1	65.46	72.2	70.3	124.64	.94	1
125	19.4	17.6	43.90	.32	3	89.1	65.93	72.3	70.4	125.64	.95	1
126	19.3	17.4	43.90	.31	3	89.1	66.41	72.4	70.6	126.63	.95	1
127	19.1	17.3	43.90	.31	3	89.1	66.88	72.5	70.7	127.63	.95	1
128	19.0	17.2	43.90	.31	3	89.1	67.36	72.7	70.9	128.62	.95	1
129	18.8	17.0	43.90	.31	3	89.2	67.83	72.8	71.0	129.62	.95	1
130	18.7	16.9	43.90	.30	3	89.2	68.31	72.9	71.2	130.61	.95	1
131	18.6	16.8	43.90	.30	3	89.2	68.78	73.0	71.3	131.61	95	1

PINION						PINION AND GEAR		GEAR				
42 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
132	18.4	16.7	43.91	.30	3	89.2	69.26	73.2	71.4	132.61	.95	1

43 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
43	46.9	42.8	4441	.70	2	88.1	30.40					
44	46.2	42.2	44.43	.70	2	88.1	30.76	47.5	43.5	45.40	.71	2
45	45.5	41.6	44.45	.69	2	88.2	31.12	48.1	44.2	46.38	.72	2
46	44.9	41.0	44.46	.68	2	88.2	31.48	48.7	44.8	47.37	.73	2
47	44.2	40.4	44.48	.67	2	88.2	31.85	49.3	45.5	4835	.74	2
48	43.6	39.8	44.49	.66	2	88.2	32.22	49.9	46.1	49.33	.74	2
49	43.0	39.2	44.50	.66	2	88.2	32.59	50.5	46.7	50.32	.75	2
50	42.4	38.7	44.52	.65	2	88.3	32.97	51.0	47.3	51.30	.76	2
51	41.8	38.1	44.53	.64	2	88.3	33.35	51.6	47.9	52.29	.76	2
52	41.3	37.6	44.54	.63	2	88.3	33.74	52.1	48.5	53.27	.77	2
53	40.7	37.1	44.55	.63	2	88.3	34.12	52.6	49.0	54.26	.77	2
54	40.2	36.6	44.56	.62	2	88.3	34.51	53.1	49.6	55.24	.78	2
55	39.6	36.1	44.58	.61	3	88.4	34.91	53.6	50.1	56.23	.79	2
56	39.1	35.6	44.59	.61	3	88.4	3530	54.1	50.6	57.22	.79	2
57	38.6	35.2	44.60	.60	3	88.4	35.70	54.6	51.1	58.20	.80	2
58	38.1	34.7	44.61	.59	3	88.4	36.10	55.0	51.6	59.19	.80	2
59	37.6	34.3	44.62	.59	3	88.4	36.50	55.5	52.1	60.18	.81	2
60	37.1	33.8	44.63	.58	3	88.4	36.91	55.9	52.6	61.16	.81	2
61	36.7	33.4	44.64	.57	3	88.5	37.32	56.4	53.1	62.15	.82	2
62	36.2	33.0	44.65	.57	3	88.5	37.72	56.8	53.5	63.14	.82	2
63	35.8	32.6	44.65	.56	3	88.5	38.14	57.2	54.0	64.13	.82	2
64	35.4	32.2	44.66	.55	3	88.5	38.55	57.6	54.4	65.11	.83	2
65	35.0	31.8	44.67	.55	3	88.5	38.97	58.0	54.8	66.10	.83	2
66	34.5	31.4	44.68	.54	3	88.5	39.99	58.4	55.3	67.09	.84	2
67	34.1	31.0	44.68	.54	3	88.6	39.80	58.8	55.7	68.08	.84	2
68	33.7	30.7	44.69	.53	3	88.6	40.23	59.1	56.0	69.07	.84	2
69	33.3	30.3	44.70	.53	3	88.6	40.65	59.5	56.4	70.06	.85	2
70	32.9	30.0	44.71	.52	3	88.6	41.08	59.8	56.9	71.05	.85	2
71	32.5	29.6	44.71	.52	3	88.6	41.50	60.2	57.3	72.04	.85	1
72	32.2	29.3	44.72	.51	3	88.6	41.93	60.5	57.6	73.03	.86	1

43 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
73	31.8	29.0	44.72	.51	3	88.6	42.36	60.8	58.0	74.02	.86	1
74	31.5	28.6	44.73	.50	3	88.7	42.79	61.2	58.3	75.01	.86	1
75	31.1	28.3	44.74	.50	3	88.7	43.23	61.5	58.7	76.00	.87	1
76	30.8	28.0	44.74	.49	3	88.7	43.66	61.8	59.0	76.99	.87	1
77	30.4	27.7	44.75	.49	3	88.7	44.10	62.1	59.4	77.98	.87	1
78	30.1	27.4	44.75	.48	3	88.7	44.53	62.4	59.7	78.97	.87	1
79	29.8	27.1	44.76	.48	3	88.7	44.97	62.7	60.0	79.96	.88	1
80	29.5	26.8	44.76	.47	3	88.7	45.41	63.0	60.3	80.95	.88	1
81	29.2	26.5	44.77	.47	3	88.7	45.85	63.3	60.6	81.94	.88	1
82	28.9	26.2	44.77	.46	3	88.8	46.29	63.6	60.9	82.93	.88	1
83	28.6	26.0	44.78	.46	3	88.8	46.74	63.8	61.2	83.92	.89	1
84	28.3	25.7	44.78	.45	3	88.8	47.18	64.1	61.5	84.91	.89	1
85	28.0	25.4	44.78	.45	3	88.8	47.63	64.4	61.8	85.90	.89	1
86	27.7	25.2	44.79	.44	3	88.8	48.07	64.6	62.1	86.89	.89	1
87	27.4	25.0	44.79	.44	3	88.8	48.52	64.9	62.4	87.89	.89	1
88	27.2	24.7	44.80	.44	3	88.8	48.97	65.1	62.6	88.88	.90	1
89	26.9	24.5	44.80	.43	3	88.8	49.42	65.4	62.9	89.87	.90	1
90	26.6	24.2	44.80	.43	3	88.8	49.87	65.6	63.2	90.86	.90	1
91	26.4	24.0	44.81	.43	3	88.9	50.32	65.9	63.5	91.86	.90	1
92	26.1	23.8	44.81	.42	3	88.9	50.78	66.1	63.7	92.85	.90	1
93	25.9	23.5	44.82	.42	3	88.9	51.23	66.3	63.9	93.84	.91	1
94	25.7	23.3	44.82	.41	3	88.9	51.68	66.5	64.2	94.83	.91	1
95	25.4	23.1	44.82	.41	3	88.9	52.14	66.7	64.4	95.83	.91	1
96	25.2	22.9	44.83	.41	3	88.9	52.60	67.0	64.6	96.82	.91	1
97	25.0	22.7	44.83	.40	3	88.9	53.05	67.2	64.9	97.81	.91	1
98	24.7	22.5	44.83	.40	3	88.9	53.51	67.4	65.1	98.81	.91	1
99	24.5	22.3	44.84	.40	3	88.9	53.97	67.6	65.3	99.80	.92	1
100	24.3	22.1	44.84	.39	3	88.9	54.43	67.8	65.5	100.79	.92	1
101	24.1	21.9	44.84	.39	3	89.0	54.88	68.0	65.8	101.78	.92	1
102	23.9	21.7	44.84	.39	3	89.0	55.35	68.2	66.0	102.78	.92	1

43 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
103	23.6	21.5	44.85	.38	3	89.0	55.80	68.4	66.2	103.77	.92	1
104	23.4	21.3	44.85	.38	3	89.0	56.27	68.6	66.4	104.76	.92	1
105	23.2	21.1	44.85	.38	3	89.0	56.73	68.7	66.6	105.76	.92	1
106	23.0	20.9	44.85	.37	3	89.0	57.19	68.9	66.8	106.75	.92	1
107	22.8	20.7	44.86	.37	3	89.0	57.66	69.1	67.0	107.75	.93	1
108	22.6	20.6	44.86	.37	3	89.0	58.12	69.3	67.2	108.74	.93	1
109	22.5	20.4	44.86	.36	3	89.0	58.59	69.5	67.4	109.73	.93	1
110	22.3	20.2	44.86	.36	3	89.0	59.05	69.6	67.6	110.73	.93	1
111	22.1	20.1	44.87	.36	3	89.0	59.52	69.8	67.8	111.72	.93	1
112	21.9	19.9	44.87	.36	3	89.0	59.98	70.0	67.9	112.72	.93	1
113	21.7	19.8	44.87	.35	3	89.0	60.45	70.1	68.1	113.71	.93	1
114	21.6	19.6	44.87	.35	3	84.1	60.92	70.3	68.3	114.71	.93	1
115	21.4	19.4	44.87	.35	3	89.1	61.39	70.5	68.5	115.70	.93	1
116	21.2	19.3	44.88	.34	3	89.1	61.86	70.6	68.6	116.69	.94	1
117	21.1	19.1	44.88	.34	3	89.1	62.33	70.8	68.8	117.69	.94	1
118	20.9	19.0	44.88	.34	3	89.1	62.80	70.9	68.9	118.68	.94	1
119	20.7	18.8	44.88	.34	3	89.1	63.26	71.1	69.1	119.68	.94	1
120	20.6	18.7	44.88	.33	3	89.1	63.73	71.2	69.3	120.67	.94	1
121	20.4	18.5	44.88	.33	3	89.1	64.21	71.3	69.4	121.67	.94	1
122	20.3	18.4	44.89	.33	3	89.1	64.68	71.5	69.6	122.66	.94	1
123	20.1	18.2	44.89	.33	3	89.1	65.15	71.6	69.8	123.66	.94	1
124	20.0	18.1	44.89	32	3	89.1	65.62	71.8	69.9	124.65	.94	1
125	19.8	18.0	44.89	.32	3	89.1	66.09	71.9	70.0	125.65	.94	1
126	19.7	17.9	44.89	.32	3	89.1	66.57	72.0	70.2	126.64	.94	1
127	19.5	17.7	44.89	.32	3	89.1	67.04	72.2	70.3	127.64	.94	1
128	19.4	17.6	44.90	.32	3	89.1	67.51	72.3	70.5	128.64	.95	1
129	19.2	17.5	44.90	.31	3	89.2	67.99	72.4	70.6	129.63	.95	1
130	19.1	17.3	44.90	.31	3	89.2	68.46	72.5	70.8	130.63	.95	1
131	19.0	17.2	44.90	.31	3	89.2	68.94	72.7	70.9	131.62	.95	1
132	18.8	17.1	44.90	.31	3	89.2	69.41	72.8	71.0	132.62	.95	1

	PINION					PINION AND GEAR		GEAR				
44 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
44	46.8	42.9	45.41	.70	2	88.2	31.11					
45	46.1	42.2	45.43	.70	2	88.2	31.47	47.5	43.6	46.40	.71	2
46	45.5	41.6	45.45	.69	2	88.2	31.83	48.1	44.2	47.38	.72	2
47	44.9	41.0	45.46	.68	2	88.2	32.19	48.7	44.8	48.36	.73	2
48	44.2	40.5	45.48	.67	2	88.2	32.56	49.3	45.5	49.35	.74	2
49	43.7	39.9	45.49	.66	2	88.3	32.93	49.8	46.1	50.33	.74	2
50	43.0	39.3	45.50	.66	2	88.3	33.30	50.4	46.7	51.32	.75	2
51	42.5	38.8	45.52	.65	2	88.3	33.68	50.9	47.3	52.30	.76	2
52	41.9	38.3	45.53	.64	2	88.3	34.06	51.5	47.9	53.29	.76	2
53	41.4	37.8	45.54	.63	2	88.3	34.44	52.0	48.4	54.27	.77	2
54	40.8	37.3	45.55	.63	2	88.4	34.83	52.5	48.9	55.26	.77	2
55	40.3	36.8	45.56	.62	2	88.4	35.22	53.0	49.5	56.25	.78	2
56	39.8	36.3	45.57	.61	2	88.4	35.61	53.5	50.0	57.23	.78	2
57	39.2	35.8	45.58	.61	2	88.4	36.00	53.9	50.5	58.22	.79	2
58	38.7	35.4	45.59	.60	2	88.4	36.40	54.4	51.0	59.21	.79	2
59	38.3	34.9	45.60	.59	2	88.4	36.80	54.8	51.5	60.19	.80	2
60	37.8	34.5	45.61	.59	3	88.5	37.20	55.3	52.0	61.18	.80	2
61	37.3	34.0	45.62	.58	3	88.5	37.61	55.7	52.5	62.17	.81	2
62	36.9	33.6	45.63	.58	3	88.5	38.01	56.1	52.9	63.16	.81	2
63	36.4	33.2	45.64	.57	3	88.5	38.42	56.5	53.4	64.14	.82	2
64	36.0	32.8	45.65	.56	3	88.5	38.83	57.0	53.8	65.13	.82	2
65	35.6	32.4	45.66	.56	3	88.5	39.25	57.4	54.2	66.12	.83	2
66	35.1	32.0	45.67	.55	3	88.6	39.66	57.8	54.7	67.11	.83	2
67	34.7	31.7	45.67	.55	3	88.6	40.08	58.1	55.0	68.10	.83	2
68	34.3	31.3	45.68	.54	3	88.6	40.50	58.5	55.5	69.09	.84	2
69	33.9	30.9	45.69	.54	3	88.6	40.92	58.9	55.9	70.07	.84	2
70	33.5	30.6	45.69	.53	3	88.6	41.34	59.2	56.3	71.06	.84	2
71	33.1	30.2	45.70	.52	3	88.6	41.76	59.6	56.7	72.05	.85	1
72	32.7	29.9	45.71	.52	3	88.6	42.19	59.9	57.0	73.04	.85	1
73	32.4	29.6	45.71	.51	3	88.7	42.62	60.3	57.4	74.03	.85	1

	PINION					PINION AND GEAR		GEAR				
44 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
74	32.0	29.2	45.72	.51	3	88.7	43.05	60.6	57.8	75.02	.86	1
75	31.7	28.9	45.73	.50	3	88.7	43.48	60.9	58.1	76.01	.86	1
76	31.3	28.6	45.73	.50	3	88.7	43.91	61.2	58.5	77.00	.86	1
77	31.0	28.3	45.74	.49	3	88.7	44.34	61.5	58.8	77.99	.87	1
78	30.7	28.0	45.74	.49	3	88.7	44.78	61.9	59.1	78.98	.87	1
79	30.3	27.7	45.75	.48	3	88.7	45.21	62.2	59.5	79.97	.87	1
80	30.0	27.4	45.75	.48	3	88.7	45.65	62.5	59.8	80.96	.87	1
81	29.7	27.1	45.76	.47	3	88.8	46.09	62.7	60.1	81.95	.88	1
82	29.4	26.8	45.76	.47	3	88.8	46.53	63.0	60.4	82.95	.88	1
83	29.1	26.5	45.77	.47	3	88.8	46.97	63.3	60.7	83.94	.88	1
84	28.8	26.3	45.77	.46	3	88.8	47.41	63.6	61.0	84.93	.88	1
85	28.5	26.0	45.78	.46	3	88.8	47.86	63.8	61.3	85.92	.89	1
86	28.2	25.7	45.78	.45	3	88.8	48.30	64.1	61.6	86.91	.89	1
87	28.0	25.5	45.79	.45	3	88.8	48.75	64.3	61.9	87.90	.89	1
88	27.7	25.2	45.79	.45	3	88.8	49.19	64.6	62.1	88.90	.89	1
89	27.4	25.0	45.79	.44	3	88.8	49.64	64.9	62.4	89.89	.89	1
90	27.1	24.7	45.80	.44	3	88.9	50.09	65.1	62.7	90.88	.90	1
91	26.9	24.5	45.80	.43	3	88.9	50.54	65.3	62.9	91.87	.90	1
92	26.6	24.3	45.80	.43	3	88.9	50.99	65.6	63.2	92.86	.90	1
93	26.4	24.0	45.81	.43	3	88.9	51.44	65.8	63.4	93.86	.90	1
94	26.2	23.8	45.81	.42	3	88.9	51.89	66.0	63.7	94.85	.90	1
95	25.9	23.6	45.82	.42	3	88.9	52.35	66.3	63.9	95.84	.91	1
96	25.7	23.4	45.82	41	3	88.9	52.80	66.5	64.1	96.83	.91	1
97	25.5	23.2	45.82	.41	3	88.9	53.26	66.7	64.4	97.83	.91	1
98	25.2	23.0	45.83	.41	3	88.9	53.71	66.9	64.6	98.82	.91	1
99	25.0	22.8	45.83	.40	3	88.9	54.17	67.1	64.8	99.81	.91	1
100	24.8	22.6	45.83	.40	3	88.9	54.63	67.3	65.1	100.81	.91	1
101	24.5	22.4	45.83	.40	3	89.0	55.08	67.5	65.3	101.80	.91	1
102	24.3	22.2	45.84	.39	3	89.0	55.54	67.7	65.5	102.79	.92	1
103	24.1	22.0	45.84	.39	3	89.0	56.00	67.9	65.7	103.79	.92	1

	PINION					PINION AND GEAR		GEAR				
44 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
104	23.9	21.8	45.84	.39	3	89.0	56.46	68.1	66.0	104.78	.92	1
105	23.7	21.6	45.85	.38	3	89.0	56.92	68.2	66.1	105.77	.92	1
106	25.5	21.4	45.85	.38	3	89.0	57.38	68.4	66.3	106.77	.92	1
107	23.3	21.2	45.85	.38	3	89.0	57.85	68.6	66.5	107.76	.92	1
108	23.1	21.0	45.85	.38	3	89.0	58.31	68.8	66.7	108.76	.92	1
109	22.9	20.9	45.86	.37	3	89.0	58.77	69.0	66.9	109.75	.93	1
110	22.7	20.7	45.86	.37	3	89.0	59.24	69.2	67.1	110.74	93	1
111	22.5	20.5	45.86	.37	3	89.0	59.70	69.3	67.3	111.74	.93	1
112	22.4	20.4	45.86	.36	3	89.0	60.17	69.5	67.5	112.73	.93	1
113	22.2	20.2	45.86	.36	3	89.1	60.63	69.7	67.7	113.72	.93	1
114	22.0	20.0	45.87	.36	3	89.1	61.10	69.8	67.8	114.72	.93	1
115	21.9	19.9	45.87	.35	3	89.1	61.56	70.0	68.0	115.71	.93	1
116	21.7	19.7	45.87	.35	3	89.1	62.03	70.2	68.2	116.71	.93	1
117	21.5	19.5	45.87	.35	3	89.1	62.50	70.3	68.3	117.70	.93	1
118	21.3	19.4	45.87	.35	3	89.1	62.97	70.5	68.5	118.70	.93	1
119	21.2	19.2	45.88	.34	3	89.1	63.44	70.6	68.7	119.69	.94	1
120	21.0	19.1	45.88	.34	3	89.1	63.90	70.8	68.9	120.69	.94	1
121	20.9	19.0	45.88	.34	3	89.1	64.37	70.9	69.0	121.68	.94	1
122	20.7	18.8	45.88	.34	3	89.1	64.85	71.0	69.2	122.68	.94	1
123	20.5	18.7	45.88	.33	3	89.1	65.32	71.2	69.3	123.67	.94	1
124	20.4	18.5	45.88	.33	3	89.1	65.79	71.3	69.5	124.67	.94	1
125	20.2	18.4	45.89	.33	3	89.1	66.26	71.5	69.6	125.66	.94	1
126	20.1	18.3	45.89	.33	3	89.1	66.73	71.6	69.8	126.66	.94	1
127	19.9	18.1	45.89	.32	3	89.1	67.20	71.7	69.9	127.65	.94	1
128	19.8	18.0	45.89	.32	3	89.2	67.68	71.9	70.1	128.65	.94	1
129	19.6	17.9	45.89	.32	3	89.2	68.15	72.0	70.2	129.65	.94	1
130	19.5	17.7	45.89	.32	3	89.2	68.62	72.1	70.4	130.64	.94	1
131	19.4	17.6	45.90	.32	3	89.2	69.10	72.3	70.5	131.64	.95	1
132	19.2	17.5	45.90	.31	3	89.2	69.57	72.4	70.6	132.63	.95	1

45 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
45	46.7	42.9	46.41	.70	2	88.2	31.82					
46	46.1	42.3	46.43	.70	2	88.2	32.18	47.3	43.7	47.40	.71	2
47	45.4	41.7	46.44	.69	2	88.2	32.53	48.0	44.3	48.38	.72	2
48	44.8	41.2	46.46	.68	2	88.3	32.90	48.6	44.9	49.37	.73	2
49	44.2	40.6	46.47	.67	2	88.3	33.26	49.2	45.5	50.35	.73	2
50	43.6	40.0	46.49	.67	2	88.3	33.63	49.7	46.1	51.34	.74	2
51	43.0	39.5	46.50	.66	2	88.3	34.01	50.2	46.7	52.32	.75	2
52	42.5	39.0	46.51	.65	2	88.3	34.38	50.8	47.3	53.31	.75	2
53	41.9	38.4	46.53	.64	2	88.3	34.76	51.3	47.9	54.29	.76	2
54	41.4	37.9	46.54	.64	2	88.4	35.15	51.8	48.4	55.28	.77	2
55	40.8	37.5	46.55	.63	2	88.4	35.53	52.3	48.9	56.26	.77	2
56	40.3	37.0	46.56	.62	2	88.4	35.92	52.8	49.4	57.25	.78	2
57	39.8	36.5	46.57	.62	2	88.4	36.31	53.3	50.0	58.24	.78	2
58	39.3	36.0	46.58	.61	2	88.4	36.70	53.8	50.5	59.22	.79	2
59	38.8	35.6	46.59	.60	2	88.5	37.10	54.2	50.9	60.21	.79	2
60	38.3	35.1	46.60	.60	2	88.5	37.50	54.7	51.4	61.20	.80	2
61	37.9	34.7	46.61	.59	2	88.5	37.90	55.1	51.9	62.19	.80	2
62	37.4	34.3	46.62	.58	2	88.5	38.30	55.5	52.3	63.17	.81	2
63	36.9	33.8	46.63	.58	2	88.5	38.71	56.0	52.8	64.16	.81	2
64	36.5	33.5	46.64	.57	2	88.5	39.12	56.4	53.2	65.15	.82	2
65	36.1	33.0	46.65	.57	2	88.5	39.53	56.8	53.7	66.14	.82	2
66	35.7	32.6	46.65	.56	3	88.6	39.94	57.1	54.1	67.13	.82	2
67	35.2	32.3	46.66	.55	3	88.6	40.35	57.5	54.5	68.11	.83	2
68	34.8	31.9	46.67	.55	3	88.6	40.77	57.9	54.9	69.10	.83	2
69	34.4	31.5	46.68	.54	3	88.6	41.19	58.3	55.3	70.09	.84	2
70	34.0	31.2	46.68	.54	3	88.6	41.61	58.6	55.7	71.08	.84	2
71	33.7	30.8	46.69	.53	3	88.6	42.03	59.0	56.1	72.07	.84	2
72	33.3	30.5	46.70	.53	3	88.6	42.45	59.3	56.5	73.06	.85	1
73	33.0	30.1	46.70	.52	3	88.7	42.88	59.7	56.8	74.05	.85	1
74	32.6	29.8	46.71	.52	3	88.7	43.30	60.0	57.2	75.04	.85	1

	PINION					PINION AND GEAR		GEAR				
45 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
75	32.2	29.5	46.72	.51	3	88.7	43.73	60 4	57.6	76.03	.86	1
76	31.9	29.1	46.72	.51	3	88.7	44.16	60.7	57.9	77.02	.86	1
77	31.5	28.8	46.73	.50	3	88.7	44.59	61.0	58.2	78.01	.86	1
78	31.2	28.5	46.73	.50	3	88.7	45.02	61.3	58.6	79.00	.86	1
79	30.9	28.2	46.74	.49	3	88.7	45.46	61.6	58.9	79.99	.87	1
80	30.6	27.9	46.74	.49	3	88.7	45.89	61.9	59.2	80.98	.87	1
81	30.2	27.6	46.75	.48	3	88.8	46.33	62.2	59.5	81.97	.87	1
82	29.9	27.3	46.75	.48	3	88.8	46.77	62 5	59.8	82.96	.87	1
83	29.6	27.1	46.76	.47	3	88.8	47.21	62.8	60.2	83.95	.88	1
84	29.3	26.8	46.76	.47	3	88.8	47.65	63.0	60.5	84.94	.88	1
85	29.0	26.5	46.77	.47	3	88.8	48.09	63.3	60.8	85.94	.88	1
86	28.8	26.3	46.77	.46	3	88.8	48.53	63 6	61.1	86.93	.88	1
87	28.5	26.0	46.78	.46	3	88.8	48.97	63.8	61.4	87.92	.89	1
88	28.2	25.8	46.78	.45	3	88.8	49.42	64.1	61.6	88.91	.89	1
89	27.9	25.5	46.79	.45	3	88.8	49.86	64.3	61.9	89.90	.89	1
90	27.7	25.3	46.79	.45	3	88.9	50.31	64.6	62.2	90.90	.89	1
91	27.4	25.0	46.79	.44	3	88.9	50.76	64.8	62.4	91.89	.89	1
92	27.2	24.8	46.80	.44	3	88.9	51.21	65.0	62.7	92.88	.90	1
93	26.9	24.6	46.80	.43	3	88.9	51.66	65.3	62.9	93.87	.90	1
94	26.7	24.3	46.80	.43	3	88.9	52.11	65.5	63.2	94.86	.90	1
95	264	24.1	46.81	.43	3	88.9	52.56	65.7	63.4	95.86	.90	1
96	26.2	23.9	46.81	.42	3	88.9	53.01	66.0	63.7	96.85	.90	1
97	25.9	23.7	46.82	.42	3	88.9	53.46	66.2	63.9	97.84	.91	1
98	25.7	23.5	46.82	.42	3	88.9	53.92	664	64.1	98.84	.91	1
99	25.5	23.3	46.82	.41	3	88.9	5437	66.6	64.4	99.83	.91	1
100	25.2	23.0	46.83	.41	3	89.0	5483	66.8	64.6	100.82	.91	1
101	25.0	22.8	46.83	.41	3	89.0	55.28	67.0	64.8	101.82	.91	1
102	24.8	22.6	46.83	.40	3	89.0	55.74	67.2	65.0	102.81	.91	1
103	24.6	22.5	46.83	.40	3	89.0	56.20	67.4	65.3	103.80	.91	1
104	24.4	22.3	46.84	.40	3	89.0	56.66	67.6	65.5	104.80	.92	1

	PINION					PINION AND GEAR		GEAR				
45 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
105	24.2	22.0	46.84	.39	3	89.0	57.12	67.8	65.7	105.79	.92	1
106	24.0	21.9	46.84	.39	3	89.0	57.58	68.0	65.9	106.78	.92	1
107	23.8	21.7	46.84	.39	3	89.0	58.04	68.2	66.1	107.78	.92	1
108	23.5	21.5	46.85	.38	3	89.0	58.50	68.4	66.3	108.77	.92	1
109	23.3	21.3	46.85	.38	3	89.0	58.96	68.5	66.5	109.76	.92	1
110	23.2	21.2	46.85	.38	3	89.0	59.42	68.7	66.7	110.76	.92	1
111	23.0	21.0	46.85	.37	3	89.0	59.89	68.9	66.9	111.75	.92	1
112	22.8	20.8	46.86	.37	3	89.0	60.35	69.0	67.0	112.75	.93	1
113	22.6	20.6	46.86	.37	3	89.1	60.81	69.2	67.2	113.74	.93	1
114	22.5	20.5	46.86	.36	3	89.1	61.28	69.4	67.4	114.73	.93	1
115	22.3	20.3	46.86	.36	3	89.1	61.75	69.6	67.6	115.73	.93	1
116	22.1	20.4	46.87	.36	3	89.1	62.21	69.7	67.8	116.72	.93	1
117	21.9	20.0	46.87	.36	3	89.1	62.68	69.9	67.9	117.72	.93	1
118	21.8	19.9	46.87	.35	3	89.1	63.14	70.0	68.1	118.71	.93	1
119	21.6	19.7	46.87	.35	3	89.1	63.61	70.2	68.3	119.71	.93	1
120	21.4	19.5	46.87	.35	3	89.1	64.08	70.3	68.4	120.70	.93	1
121	21.3	19.4	46.87	.35	3	89.1	64.55	70.5	68.6	121.70	.93	1
122	21.1	19.2	46.88	.34	3	89.1	65.02	70.6	68.8	122.69	94	1
123	20.9	19.1	46.88	.34	3	89.1	65.48	70.8	68.9	123.69	.94	1
124	20.8	19.0	46.88	.34	3	89.1	65.96	70.9	69.1	124.68	.94	1
125	20.6	18.8	46.88	.34	3	89.1	66.43	71.1	69.2	125.68	94	1
126	20.5	18.7	46.88	.33	3	89.1	66.90	71.2	69.4	126.67	.94	1
127	20.3	18.5	46.89	.33	3	89.1	67.37	71.3	69.5	127.67	.94	1
128	20.2	18.4	46.89	.33	3	89.2	67.84	71.5	69.7	128.66	.94	1
129	20.0	18.3	46.89	.33	3	89.2	68.31	71.6	69.8	129.66	.94	1
130	19.9'	18.1	46.89	.32	3	89.2	68.78	71.7	70.0	130.65	.94	1
131	19.7	18.0	46.89	.32	3	89.2	69.26	71.9	70.1	131.65	.94	1
132	19.6	17.9	46.89	.32	3	89.2	69.73	72.0	70.3	132.65	.94	1

46 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
46	46.7	43.0	47.41	.70	2	88.2	32.53					
47	46.1	42.4	47.43	.70	2	88.3	32.88	47.4	43.7	48.40	.71	2
48	45.4	41.8	47.44	.69	2	88.3	33.24	48.0	44.3	49.38	.72	2
49	44.8	41.2	47.46	.68	2	88.3	33.60	48.5	44.9	50.37	.73	2
50	44.2	40.7	47.47	.67	2	88.3	33.97	49.1	45.4	51.35	.73	2
51	43.7	40.1	47.49	.67	2	88.3	34.84	49.6	46.1	52.34	.74	2
52	43.1	39.6	47.50	.66	2	88.3	34.71	50.2	46.7	53.32	.75	2
53	42.5	39.1	47.51	.65	2	88.4	35.09	50.7	47.2	54.31	.75	2
54	42.0	38.6	47.52	.64	2	88.4	35.47	51.2	47.8	55.29	.76	2
55	41.4	38.0	47.54	.64	2	88.4	35.85	51.7	48.3	56.28	.77	2
56	40.9	37.6	47.55	.63	2	88.4	36.23	52.2	48.8	57.27	.77	2
57	40.4	37.1	47.56	.62	2	88.4	36.62	52.7	49.3	58.25	.78	2
58	39.9	36.6	47.57	.62	2	88.4	37.01	53.1	49.8	59.24	.78	2
59	39.4	36.2	47.58	.61	2	88.5	37.41	53.6	50.3	60.23	.79	2
60	38.9	35.7	47.59	.60	2	88.5	37.80	54.0	50.8	61.21	.79	2
61	38.5	35.3	47.60	.60	2	88.5	38.20	54.5	51.3	62.20	.80	2
62	38.0	34.9	47.61	.59	2	88.5	38.60	54.9	51.8	63.19	.80	2
63	37.5	34.4	47.62	.59	2	88.5	39.00	55.3	52.2	64.18	.81	2
64	37.1	34.0	47.63	.58	2	88.5	39.41	55.7	52.7	65.17	.81	2
65	36.7	33.6	47.64	.57	2	88.6	39.81	56.2	53.1	66.15	.82	2
66	36.3	33.3	47.64	.57	2	88.6	40.22	56.5	53.5	67.14	.82	2
67	35.8	32.9	47.65	.56	2	88.6	40.63	56.9	54.0	68.13	.82	2
68	35.4	32.5	47.66	.56	2	88.6	41.05	57.3	54.4	69.12	.83	2
69	35.0	32.1	47.67	.55	2	88.6	41.46	57.7	54.8	70.11	.83	2
70	34.6	31.8	47.67	.55	2	88.6	41.88	58.1	55.2	71.10	.83	2
71	34.2	31.4	47.68	.54	2	88.6	42.30	58.4	55.5	72.09	.84	2
72	33.9	31.0	47.69	.54	3	88.7	42.72	58.8	55.9	73.08	.84	2
73	33.5	30.7	47.69	.53	3	88.7	43.14	59.1	56.3	74.07	.85	1
74	33.1	30.4	47.70	.53	3	88.7	43.57	59.5	56.7	75.06	.85	1
75	32.8	30.0	47.71	.52	3	88.7	43.99	59.8	57.0	76.05	.85	1

46 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
76	32.4	29.7	47.71	52	3	88.7	44.42	60.1	57.4	77.04	.85	1
77	32.1	29.4	47.72	.51	3	88.7	44.85	60.4	57.7	78.03	.86	1
78	31.7	29.1	47.72	.51	3	88.7	45.28	60.7	58.0	79.02	.86	1
79	31.4	28.8	47.73	.50	3	88.7	45.71	61.0	58.4	80.01	86	1
80	31.1	28.5	47.73	50	3	88.8	46.14	61.3	58.7	81.00	86	1
81	30.8	28.2	47.74	.49	3	88.8	46.57	61.7	59.0	81.99	87	1
82	30.5	27.9	47.75	49	3	88.8	47.01	61.9	59.3	82.98	.87	1
83	30.1	27.6	47.75	.48	3	88.8	47.45	62.2	59.6	83.97	.87	1
84	29.9	27.3	47.76	.48	3	88.8	47.88	62.5	60.0	84.96	.88	1
85	29.6	27.1	47.76	.47	3	88.8	48.32	62.8	60.3	85.95	.88	1
86	29.3	26.8	47.76	.47	3	88.8	48.76	63.0	60.5	86.94	.88	1
87	29.0	26.5	47.77	.47	3	88.8	49.21	63.3	60.8	87.94	.88	1
88	28.7	26.3	47.77	.46	3	88.8	49.65	63.5	61.1	88.93	.88	1
89	28.4	26.0	47.78	.46	3	88.9	50.09	63.8	61.4	89.92	.89	1
90	28.1	25.8	47.78	.45	3	88.9	50.54	64.1	61.7	90.91	.89	1
91	27.9	25.5	47.79	.45	3	88.9	50.98	64.3	61.9	91.90	.89	1
92	27.6	25.3	47.79	45	3	88.9	51.43	64.5	62.2	92.90	.89	1
93	27.4	25.0	47.79	.44	3	88.9	51.88	64.8	62.5	93.89	.89	1
94	27.1	24.8	47.80	.44	3	88.9	52.33	65.0	62.7	94.88	.90	1
95	26.9	24.6	47.80	.43	3	88.9	52.77	65.3	63.0	95.87	.90	1
96	26.6	24.4	47.80	.43	3	88.9	53.22	65.5	63.2	96.87	.90	1
97	26.4	24.1	47.81	.43	3	88.9	53.68	65.7	63.4	97.86	.90	1
98	26.2	23.9	47.81	.42	3	88.9	54.13	65.9	63.7	98.85	.90	1
99	25.9	23.7	47.81	.42	3	88.9	54.58	66.1	63.9	99.84	.90	1
100	25.7	23.5	47.82	.42	3	89.0	55.04	66.3	64.1	100.84	.91	1
101	25.5	23.3	47.82	.41	3	89.0	55.49	66.5	64.4	101.83	.91	1
102	25.3	23.1	47.82	.41	3	89.0	55.95	66.7	64.6	102.82	.91	1
103	25.0	22.9	47.83	.41	3	89.0	56.40	67.0	64.8	103.82	.91	1
104	24.8	22.7	47.83	.40	3	89.0	56.86	67.2	65.0	104.81	.91	1
105	24.6	22.5	47.83	.40	3	89.0	57.32	67.4	65.2	105.80	.91	1

46 EETH NTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
106	24.4	22.3	47.84	.40	3	89.0	57.77	67.5	65.4	106.80	.92	1
107	24.2	22.1	47.84	.39	3	89.0	58.23	67.7	65.6	107.79	.92	1
108	24.0	22.0	47.84	.39	3	89.0	58.69	67.9	65.9	108.78	.92	1
109	23.8	21.8	47.84	.39	3	89.0	59.15	68.1	66.1	109.78	.92	1
110	23.6	21.6	47.85	.38	3	89.0	59.61	68.3	66.3	110.77	.92	1
111	23.4	21.4	47.85	.38	3	89.0	60.08	68.4	66.4	111.77	.92	1
112	23.2	21.3	47.85	.38	3	89.1	60.54	68.6	66.6	112.76	.92	1
113	23.0	21.1	47.85	.37	3	89.1	61.00	68.8	66.8	113.75	.92	1
114	22.9	20.9	47.86	.37	3	89.1	61.47	69.0	67.0	114.75	.93	1
115	22.7	20.7	47.86	.37	3	89.1	61.93	69.1	67.2	115.74	.93	1
116	22.5	20.6	4786	.37	3	89.1	62.39	69.3	67.3	116.74	.93	1
117	22.3	20.4	47.86	.36	3	89.1	62.86	69.5	67.5	117.73	.93	1
118	22.2	20.3	47.86	.36	3	89.1	63.32	69.6	67.7	118.73	.93	1
119	22.0	20.1	47.87	.36	3	89.1	63.79	69.8	67.9	119.72	.93	1
120	21.8	20.0	47.87	.36	3	89.1	64.26	69.9	68.0	120.72	.93	1
121	21.7	19.8	47.87	.35	3	89.1	64.72	70.1	68.2	121.71	.93	1
122	21.5	19.7	47.87	.35	3	89.1	65.19	70.2	68.3	122.71	.93	1
123	21.3	19.5	47.87	.35	3	89.1	65.66	70.4	68.5	123.70	.93	1
124	21.2	19.4	47.88	.34	3	89.1	66.13	70.5	68.7	124.69	.94	1
125	21.0	19.2	47.88	.34	3	89.1	66.60	70.7	68.8	125.69	.94	1
126	20.9	19.1	47.88	.34	3	89.1	67.06	70.8	69.0	126.69	.94	1
127	20.7	18.9	47.88	.34	3	89.1	67.54	71.0	69.1	127.68	.94	1
128	20.6	18.8	47.88	.34	3	89.2	68.01	71.1	69.3	128.68	.94	1
129	20.4	18.7	47.88	.33	3	89.2	6848	71.2	69.4	129.67	.94	1
130	20.3	18.5	47.89	.33	3	89.2	68.95	71.3	69.6	130.67	.94	1
131	20.1	18.4	47.89	.33	3	89.2	6942	71.5	69.7	131.66	.94	1
132	20.0	18.3	47.89	.33	3	89.2	69.89	71.6	69.9	132.66	.94	1

47 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
47	46.7	43.0	48.41	.70	2	88.3	33.23					
48	46.0	42.4	48.43	.70	2	88.3	33.59	47.3	43.7	49.40	.71	2
49	45.4	41.9	48.44	.69	2	88.3	33.95	47.9	44.3	50.38	.72	2
50	44.8	41.3	48.46	.68	2	88.3	34.31	48.4	44.9	51.37	.73	2
51	44.2	40.8	48.47	.67	2	88.3	34.68	49.0	45.5	52.35	.73	2
52	43.7	40.2	48.49	.67	2	88.4	35.05	49.5	46.0	53.34	.74	2
53	43.1	39.7	48.50	.66	2	88.4	35.42	50.0	46.6	54.32	.75	2
54	42.5	39.2	48.51	.65	2	88.4	35.79	50.6	47.2	55.31	.75	2
55	42.0	38.7	48.52	.65	2	88.4	36.17	51.1	47.7	56.30	.76	2
56	41.5	38.2	48.53	.64	2	88.4	36.56	51.6	48.2	57.28	.76	2
57	41.0	37.7	48.54	.63	2	88.4	36.94	52.0	48.7	58.27	.77	2
58	40.5	37.3	48.55	.63	2	88.5	37.33	52.5	49.3	59.26	.77	2
59	40.0	36.8	48.57	.62	2	88.5	37.71	53.0	49.8	60.24	.78	2
60	39.5	36.3	48.58	.61	2	88.5	38.11	53.4	50.2	61.23	.79	2
61	39.0	35.9	48.59	.61	2	88.5	38.50	53.9	50.7	62.22	.79	2
62	38.6	35.5	48.60	.60	2	88.5	38.90	54.3	51.2	63.21	.80	2
63	38.1	35.1	48.60	.59	2	88.5	39.30	54.7	51.6	64.19	.80	2
64	37.7	34.7	48.61	.59	2	88.6	39.70	55.1	52.1	65.18	.80	2
65	37.2	34.2	48.62	.58	2	88.6	40.10	55.5	52.5	66.17	.81	2
66	36.8	33.8	48.63	.58	2	88.6	40.51	55.9	53.0	67.16	.81	2
67	36.4	33.4	48.64	.57	2	88.6	40.92	56.4	53.4	68.15	.82	2
68	36.0	33.1	48.65	.57	2	88.6	41.33	56.7	53.8	69.14	.82	2
69	35.6	32.7	48.66	.56	2	88.6	41.74	57.1	54.2	70.12	.83	2
70	35.2	32.3	48.66	.55	2	88.6	42.16	57.5	54.6	71.11	.83	2
71	34.8	32.0	48.67	.55	2	88.7	42.57	57.8	55.0	72.10	.83	2
72	34.4	31.6	48.68	.54	2	88.7	42.99	58.2	55.4	73.09	.84	2
73	34.0	31.3	48.68	.54	2	88.7	43.41	58.5	55.8	74.08	.84	1
74	33.7	30.9	48.69	.53	2	88.7	43.83	58.9	56.1	75.07	.84	1
75	33.3	30.6	48.70	.53	2	88.7	44.25	59.2	56.5	76.06	.85	1
76	33.0	30.3	48.70	.52	2	88.7	44.68	59.5	56.8	77.05	.85	1

47	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
77	32.6	30.0	48.71	.52	2	88.7	45.10	59.9	57.2	78.04	.85	1
78	32.3	29.6	48.71	.51	2	88.7	45.53	60.2	57.5	79.03	.85	1
79	32.0	29.3	48.72	.51	2	88.8	45.96	60.5	57.9	80.02	.86	1
80	31.6	29.0	48.73	.50	3	88.8	46.39	60.8	58.2	81.01	.86	1
81	31.3	28.7	48.73	.50	3	88.8	46.82	61.1	58.5	82.00	.86	1
82	31.0	28.4	48.74	.50	3	88.8	47.26	61.4	58.8	83.00	.87	1
83	30.7	28.1	48.74	.49	3	88.8	47.69	61.7	59.1	83.99	.87	1
84	30.4	27.9	48.75	.49	3	88.8	48.13	62.0	59.4	84.98	.87	1
85	30.1	27.6	48.75	.48	3	88.8	48.56	62.2	59.7	85.97	.87	1
86	29.8	27.3	48.76	.48	3	88.8	49.00	62.5	60.0	86.96	.88	1
87	29.5	27.0	48.76	.47	3	88.8	49.44	62.8	60.3	87.95	.88	1
88	29.2	26.8	48.77	.47	3	88.8	49.88	63.0	60.6	88.94	.88	1
89	28.9	26.5	48.77	.46	3	88.9	50.32	63.3	60.9	89.93	.88	1
90	28.7	26.3	48.77	.46	3	88.9	50.76	63.5	61.2	90.93	.88	1
91	28.4	26.0	48.78	.46	3	88.9	51.21	63.8	61.4	91.92	.89	1
92	28.1	25.8	48.78	.45	3	88.9	51.65	64.0	61.7	92.91	.89	1
93	27.9	25.5	48.79	.45	3	88.9	52.10	64.3	61.9	93.90	.89	1
94	27.6	25.3	48.79	.45	3	88.9	52.55	64.5	62.2	94.90	.89	1
95	27.4	25.1	48.79	.44	3	88.9	53.00	64.8	62.5	95.89	.89	1
96	27.1	24.9	48.80	.44	3	88.9	53.44	65.0	62.7	96.88	.90	1
97	26.9	24.6	48.80	.43	3	88.9	53.89	65.2	63.0	97.87	.90	1
98	26.6	24.4	48.80	.43	3	88.9	54.34	65.4	63.2	98.87	.90	1
99	26.4	24.2	48.81	.43	3	89.0	54.79	65.6	63.4	99.86	.90	1
100	26.2	24.0	48.81	.42	3	89.0	55.25	65.9	63.7	100.85	.90	1
101	26.0	23.8	48.81	.42	3	89.0	55.70	66.1	63.9	101.84	.90	1
102	25.7	23.6	48.82	.42	3	89.0	56.15	66.3	64.1	102.84	.91	1
103	25.5	23.4	48.82	.41	3	89.0	56.61	66.5	64.3	103.83	.91	1
104	25.3	23.2	48.82	.41	3	89.0	57.06	66.7	64.5	104.83	.91	1
105	25.1	23.0	48.83	.41	3	89.0	57.52	66.9	64.8	105.82	.91	1
106	24.9	22.8	48.83	.40	3	89.0	57.98	67.1	65.0	106.81	.91	1

47 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
107	24.6	22.6	48.83	.40	3	89.0	58.43	67.3	65.2	107.81	.91	1
108	24.4	22.4	48.83	.40	3	89.0	58.89	67.5	65.4	108.80	.91	1
109	24.2	22.2	48.84	.39	3	89.0	59.35	67.6	65.6	109.79	.92	1
110	24.0	22.0	48.84	.39	3	89.0	59.81	67.8	65.8	110.79	.92	1
111	23.9	21.9	48.84	.39	3	89.0	60.27	68.0	66.0	111.78	.92	1
112	23.7	21.7	48.84	.38	3	89.1	60.73	68.2	66.2	112.77	.92	1
113	23.5	21.5	48.85	.38	3	89.1	61.19	68.3	66.4	113.77	.92	1
114	23.3	21.3	48.85	.38	3	89.1	61.65	68.5	66.6	114.76	.92	1
115	23.1	21.2	48.85	.38	3	89.1	62.12	68.7	66.7	115.76	.92	1
116	22.9	21.0	48.85	.37	3	89.1	62.58	68.9	66.9	116.75	.92	1
117	22.8	20.9	48.86	.37	3	89.1	63.04	69.0	67.1	117.75	93	1
118	22.6	20.7	48.86	.37	3	89.1	63.51	69.2	67.3	118.74	.93	1
119	22.4	20.5	48.86	.36	3	89.1	63.97	69.3	67.4	119.73	.93	1
120	22.2	20.4	48.86	.36	3	89.1	64.44	69.5	67.6	120.73	.93	1
121	22.1	20.2	48.86	.36	3	89.1	64.90	69.6	67.8	121.72	.93	1
122	21.9	20.1	48.87	.36	3	89.1	65.37	69.8	67.9	122.72	.93	1
123	21.7	19.9	48.87	.35	3	89.1	65.84	70.0	68.1	123.71	.93	1
124	21.6	19.8	48.87	.35	3	89.1	66.30	70.1	68.3	124.71	.93	1
125	21.4	19.6	48.87	.35	3	89.1	66.77	70.2	68.4	125.70	.93	1
126	21.3	19.5	48.87	.35	3	89.1	67.24	70.4	68.6	126.70	.93	1
127	21.1	19.3	48.88	.34	3	89.2	67.71	70.6	68.7	127.69	.94	1
128	21.0	19.2	48.88	.34	3	89.2	68.18	70.7	68.9	128.69	.94	1
129	20.8	19.0	48.88	.34	3	89.2	68.65	70.8	69.0	129.68	.94	1
130	20.7	18.9	48.88	.34	3	89.2	69.12	71.0	69.2	130.68	.94	1
131	20.5	18.8	48.88	.34	3	89.2	69.59	71.1	69.3	131.68	.94	1
132	20.4	18.7	48.88	.33	3	89.2	70.06	71.2	69.5	132.67	.94	1

48 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
48	46.6	43.1	49.41	70	2	88.3	33.94					
49	46.0	42.5	49.43	.70	2	88.3	34.30	47.2	43.7	50.40	.71	2
50	45.4	42.0	49.44	.69	2	88.3	34.66	47.8	44.3	51.38	.72	2
51	44.9	41.4	49.46	.68	2	88.4	35.02	48.3	44.9	52.37	.73	2
52	44.3	40.9	49.47	.67	2	88.4	35.38	48.9	45.5	53.35	.73	2
53	43.7	40.4	49.48	.67	2	88.4	35.75	49.4	46.0	54.34	74	2
54	43.1	39.9	49.50	.66	2	88.4	36.12	49.9	46.6	55.33	.75	2
55	42.6	39.3	49.51	.65	2	88.4	36.50	50.4	47.1	56.31	.75	2
56	42.1	38.9	49.52	.65	2	88.4	36.88	50.9	47.6	57.30	.76	2
57	41.6	38.4	49.53	.64	2	88.5	37.26	51.4	48.1	58.29	.76	2
58	41.1	37.9	49.54	.63	2	88.5	37.64	51.9	48.7	59.27	.77	2
59	40.6	37.4	49.55	.63	2	88.5	38.03	52.4	49.2	60.26	.77	2
60	40.1	37.0	49.56	.62	2	88.5	38.42	52.8	49.6	61.25	.78	2
61	39.6	36.5	49.57	61	2	88.5	38.81	53.3	50.1	62.23	.78	2
62	39.1	36.1	49.58	.61	2	88.5	39.20	53.7	50.6	63.22	.79	2
63	38.7	35.7	49.59	.60	2	88.6	39.60	54.1	51.0	64.21	.79	2
64	38.2	35.3	49.60	.60	2	88.6	40.00	54.5	51.5	65.20	.80	2
65	37.8	34.9	49.61	.59	2	88.6	40.40	55.0	52.0	66.19	.80	2
66	37.4	34.5	49.62	58	2	88.6	40.80	55.4	52.4	67.17	.81	2
67	37.0	34.0	49.63	58	2	88.6	41.21	55.8	52.8	68.16	.81	2
68	36.5	33.7	49.64	.57	2	88.6	41.62	56.1	53.2	69.15	.82	2
69	36.1	33.3	49.64	.57	2	88.6	42.03	56.5	53.6	70.14	.82	2
70	35.8	32.9	49.65	56	2	88.6	42.44	56.9	54.0	71.13	.82	2
71	35.4	32.5	49.66	.56	2	88.7	42.85	57.3	54.4	72.12	.83	2
72	35.0	32.2	49.67	.55	2	88.7	43.27	57.6	54.8	73.11	.83	2
73	34.6	31.9	49.67	.55	2	88.7	43.68	58.0	55.2	74.10	.83	2
74	34.2	31.5	49.68	.54	2	88.7	44.10	58.3	55.5	75.09	.84	1
75	33.9	31.2	49.69	.54	2	88.7	44.52	58.7	55.9	76.08	.84	1
76	33.5	30.8	49.69	.53	2	88.7	44.94	59.0	56.3	77.07	.84	1
77	33.2	30.5	49.70	.53	2	88.7	45.37	59.3	56.6	78.06	.85	1

	PINION					PINION AND GEAR		GEAR				
48 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
78	32.8	30.2	49.71	.52	2	88.7	45.79	59.6	57.0	79.05	.85	1
79	32.5	29.9	49.71	.52	2	88.8	46.22	59.9	57.3	80.04	.85	1
80	32.2	29.6	49.72	.51	2	88.8	46.65	60.2	57.6	81.03	.86	1
81	31.8	29.3	49.72	.51	2	88.8	47.08	60.5	58.0	82.02	.86	1
82	31.5	29.0	49.73	.50	2	88.8	47.51	60.8	58.3	83.01	.86	1
83	31.2	28.7	49.73	.50	2	88.8	47.94	61.1	58.6	84.00	.86	1
84	30.9	28.4	49.74	.49	2	88.8	48.37	61.4	58.9	84.99	.87	1
85	30.6	28.1	49.74	.49	2	88.8	48.81	61.7	59.2	85.98	.87	1
86	30.3	27.9	49.75	.49	2	88.8	49.24	62.0	59.5	86.98	.87	1
87	30.0	27.6	49.75	.48	2	88.8	49.68	62.3	59.8	87.97	.87	1
88	29.7	27.3	49.76	.48	2	88.9	50.12	62.5	60.1	88.96	.88	1
89	29.4	27.0	49.76	.47	3	88.9	50.56	62.8	60.4	89.95	.88	1
90	29.2	26.8	49.77	.47	3	88.9	51.00	63.0	60.7	90.94	.88	1
91	28.9	26.5	49.77	.46	3	88.9	51.44	63.3	60.9	91.93	.88	1
92	28.6	26.3	49.77	.46	3	88.9	51.88	63.5	61.2	92.93	.88	1
93	28.4	26.0	49.78	.46	3	88.9	52.33	63.8	61.5	93.92	.89	1
94	28.1	25.8	49.78	.45	3	88.9	52.77	64.0	61.7	94.91	.89	1
95	27.9	25.6	49.78	.45	3	88.9	53.22	64.3	62.0	95.90	.89	1
96	27.6	25.3	49.79	.45	3	88.9	53.66	64.5	62.2	96.90	.89	1
97	27.4	25.1	49.79	.45	3	88.9	54.11	64.7	62.5	97.89	.89	1
98	27.1	24.9	49.80	.44	3	88.9	54.56	64.9	62.7	98.88	.90	1
99	26.9	24.7	49.80	.43	3	89.0	55.01	65.2	63.0	99.87	.90	1
100	26.7	24.5	49.80	.43	3	89.0	55.46	65.4	63.2	100.87	.90	1
101	26.4	24.3	49.81	.43	3	89.0	55.91	65.6	63.4	101.86	.90	1
102	26.2	24.1	49.81	.42	3	89.0	56.36	65.8	63.6	102.85	.90	1
103	26.0	23.8	49.81	.42	3	89.0	56.82	66.0	63.9	103.85	.90	1
104	25.8	23.6	49.82	.42	3	89.0	57.27	66.2	64.1	104.84	.91	1
105	25.5	23.4	49.82	.41	3	89.0	57.73	66.4	64.3	105.83	.91	1
106	25.3	23.3	49.82	.41	3	89.0	58.18	66.6	64.5	106.83	.91	1
107	25.1	23.1	49.83	.41	3	89.0	58.64	66.8	64.7	107.82	.91	1

	PINION					PINION AND GEAR		GEAR				
48 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
108	24.9	22.9	49.83	.40	3	89.0	59.09	67.0	64.9	108,81	.91	1
109	24.7	22.7	49.83	.40	3	89.0	59.55	67.2	65.1	109.81	.91	1
110	24.5	22.5	49.83	.40	3	89.0	60.01	67.4	65.3	110.80	.91	1
111	24.3	22.3	49.84	.40	3	89.1	60.47	67.5	65.5	111.80	.92	1
112	24.1	22.1	49.84	.39	3	89.1	60.93	67.7	65.7	112.79	.92	1
113	23.9	22.0	49.84	.39	3	89.1	61.39	67.9	65.9	113.78	.92	1
114	23.7	21.8	49.84	.39	3	89.1	61.85	68.1	66.1	114.78	.92	1
115	23.5	21.6	49.85	.38	3	89.1	62.31	68.2	66.3	115.77	.92	1
116	23.4	21.5	49.85	.38	3	89.1	62.77	68.4	66.5	116.77	.92	1
117	23.2	21.3	49.85	.38	3	89.1	63.31	68.6	66.7	117.76	.92	1
118	23.0	21.1	49.85	.37	3	89.1	63.69	68.7	66.8	118.75	.92	1
119	22.8	21.0	49.86	.37	3	89.1	64.16	68.9	67.0	119.75	.93	1
120	22.7	20.8	49.86	.37	3	89.1	64.62	69.0	67.2	120.74	.93	1
121	22.5	20.6	49.86	.37	3	89.1	65.09	69.2	67.3	121.74	.93	1
122	22.4	20.5	49.86	.36	3	89.1	65.55	69.4	67.5	122.73	.93	1
123	22.2	20.3	49.86	.36	3	89.1	66.02	69.5	67.7	123.73	.93	1
124	22.0	20.2	49.87	.36	3	89.1	66.44	69.7	67.9	124.72	.93	1
125	21.9	20.0	49.87	.36	3	89.1	66.95	69.8	68.0	125.72	.93	1
126	21.7	19.9	49.87	.35	3	89.1	67.42	70.0	68.2	126.71	.93	1
127	21.6	19.8	49.87	.35	3	89.2	67.88	70.1	68.3	127.71	.93	1
128	21.4	19.6	49.87	.35	3	89.2	68.35	70.3	68.5	128.70	.93	1
129	21.2	19.5	49.87	.35	3	89.2	68.82	70.4	68.6	129.70	.93	1
130	21.1	19.3	49.88	.34	3	89.2	69.29	70.5	68.8	130.69	.94	1
131	20.9	19.2	49.88	.34	3	89.2	69.76	70.7	68.9	131.69	.94	1
132	20.8	19.1	49.88	.34	3	89.2	70.23	70.8	69.1	132.68	.94	1

49 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
49	46.6	43.1	50.41	.70	2	88.3	34.65					
50	46.0	42.6	50.43	.70	2	88.4	35.00	47.2	43.7	51.40	.71	2
51	45.4	42.0	50.44	.69	2	88.4	35.36	47.8	44.3	52.38	.72	2
52	44.8	41.5	50.46	.68	2	88.4	35.72	48.3	44.9	53.37	.73	2
53	44.3	40.9	50.47	.68	2	88.4	36.09	48.8	45.5	54.36	.73	2
54	43.7	40.4	50.48	.67	2	88.4	36.46	49.3	46.0	55.34	.74	2
55	43.2	39.9	50.49	.66	2	88.4	36.83	49.9	46.6	56.33	.74	2
56	42.6	39.4	50.51	.65	2	88.5	37.21	50.4	47.1	57.31	.75	2
57	42.1	38.9	50.52	.65	2	88.5	37.58	50.8	47.6	58.30	.76	2
58	41.6	38.5	50.53	.64	2	88.5	37.96	51.3	48.1	59.29	.76	2
59	41.1	38.0	50.54	.64	2	88.5	38.35	51.8	48.6	60.28	.77	2
60	40.7	37.5	50.55	.63	2	88.5	38.73	52.2	49.1	61.26	.77	2
61	40.2	37.1	50.56	.62	2	88.5	39.12	52.7	49.6	62.25	.78	2
62	39.7	36.7	50.57	.62	2	88.5	39.51	53.1	50.1	63.24	.78	2
63	39.2	36.2	50.58	.61	2	88.6	39.90	53.6	50.5	64.23	.79	2
64	38.8	35.8	50.59	.60	2	88.6	40.30	54.0	51.0	65.21	.79	2
65	38.4	35.4	50.60	.60	2	88.6	40.70	54.4	51.5	66.20	.80	2
66	37.9	35.0	50.61	.59	2	88.6	41.10	54.8	51.9	67.19	.80	2
67	37.5	34.6	50.62	.59	2	88.6	41.50	55.2	52.3	68.18	.81	2
68	37.1	34.2	50.63	.58	2	88.6	41.91	55.6	52.7	69.17	.81	2
69	36.7	33.8	50.63	.56	2	88.7	42.31	56.0	53.1	70.16	.81	2
70	36.3	33.5	50.64	.57	2	88.7	42.72	56.3	53.5	71.14	.82	2
71	35.9	33.1	50.65	.56	2	88.7	43.13	56.7	53.9	72.13	.82	2
72	35.5	32.7	50.66	.56	2	88.7	43.55	57.1	54.3	73.12	83	2
73	35.1	32.4	50.66	.55	2	88.7	43.96	57.4	54.7	74.11	.83	2
74	34.7	32.0	50.67	.55	2	88.7	44.38	57.8	55.0	75.10	.83	1
75	34.4	31.7	50.68	.54	2	88.7	44.79	58.1	55.4	76.09	.84	1
76	34.0	31.4	50.68	.54	2	88.7	45.21	58.4	55.8	77.08	.84	1
77	33.7	31.0	50.69	.53	2	88.7	45.63	58.8	56.1	78.07	.84	1
78.	33.3	30.7	50.70	.53	2	88.8	46.06	59.1	56.5	79.06	.85	1

49 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
79	33 0	30 4	50.70	.52	2	88.8	46.48	59.4	56.8	80.05	.85	1
80	32.7	30.1	50.71	.52	2	88.8	46.91	59.7	57.1	81.05	.85	1
81	32.3	29.8	50.71	.52	2	88.8	47.33	60.0	57.5	82.04	.85	1
82	32 0	29.5	50.72	.51	2	88.8	47.76	60.3	57 8	83.03	.86	1
83	31 7	29.2	50.72	.51	2	88.8	48.19	60.6	58.1	84.02	.86	1
84	31.4	28.9	50 73	.50	2	88.8	48.62	60.9	58.4	85.01	.86	1
85	31 1	28.6	50.73	.50	2	88.8	49.05	61.2	58.7	86.00	.86	1
86	30 8	28.3	50.74	.49	2	88.8	49.49	61.5	59.0	86.99	.87	1
87	30 5	28.1	50.74	.49	2	88.9	49.92	61.7	59.3	87.98	.87	1
88	30.2	27.8	50.75	.48	2	88.9	50.36	62.0	59.6	88.97	.87	1
89	29 9	27 5	50 75	.48	2	88.9	50.80	62.3	59.9	89.97	.87	1
90	29.6	27.3	50.76	.48	2	88.9	51.24	62.5	60.2	90.96	.88	1
91	29 4	27.0	50.76	.47	2	88.9	51.68	62 8	60.5	91.95	.88	1
92	29.1	26 8	50.77	.47	2	88.9	52.12	63.0	60.7	92.94	.88	1
93	28.8	26 5	50.77	.46	2	88.9	52.56	63.3	61.0	93.93	.88	1
94	28 6	26.3	50.77	.46	2	88.9	53.00	63.5	61.3	94 92	.88	1.
95	28 3	26.1	50.78	.46	2	88.9	53.44	63 8	61.5	95.92	.89	1
96	28.1	25.8	50.78	.45	2	88.9	53.89	64.0	61.8	96.91	.89	1
97	27.8	25.6	50.79	.45	2	89.0	54.34	64.2	62.0	97.90	.89	1
98	27.6	25.4	50.79	.45	2	89.0	54.78	64.5	62.3	98.90	.89	1
99	27.3	25.1	50.79	.44	2	89.0	55.23	64.7	62.5	99 89	.89	1
100	27.1	24.9	50.80	.44	3	89.0	55.68	64.9	62.7	100 88	.90	1
101	26.9	24.7	50.80	.43	3	89.0	56.13	65.1	63.0	101.87	.90	1
102	26.6	24.5	50.80	.43	3	89.0	56.58	65.3	63.2	102.87	90	1
103	26.4	24.3	50.81	.43	3	89.0	57.03	65.6	63.4	103.86	.90	1
104	26.2	24.1	50.81	.42	3	89.0	57.48	65.8	63.7	104.85	.90	1
105	26.0	23.9	50.81	.42	3	89.0	57.93	66.0	63.9	105.85	.90	1
106	25.7	23.7	50.82	.42	3	89.0	58.39	66.2	64.1	106 84	.91	1
107	25.5	23.5	50.82	.41	3	89 0	58.84	66.4	64.3	107.83	.91	1
108	25.3	23.3	50.82	.41	3	89.0	59.30	66.6	64.5	108 83	.91	1

49 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
109	25.1	23.1	50.83	.41	3	89.0	59 75	66.7	64.7	109.82	.91	1
110	24 9	22.9	50.83	41	3	89.0	60.21	66.9	64 9	110.82	.91	1
111	24.7	22 8	50 83	.40	3	89.1	60.67	67.1	65.1	111.81	.91	1
112	24.5	22.6	50.83	.40	3	89.1	61.12	67.3	65.3	112.80	.91	1
113	24 4	22.4	50 84	.40	3	89.1	61.58	67.5	65.5	113.80	.92	1
114	24.2	22 2	50.84	39	3	89 1	62.09	67.6	65.7	114.79	.92	1
115	24.0	22 0	50.84	39	3	89.1	62.50	67 8	65.9	115.79	.92	1
116	23.8	21.9	50 84	39	3	89.1	62 96	68 0	66.1	116.78	.92	1
117	23.6	21.7	50.85	38	3	89 1	63.42	68 2	66 3	117.77	.92	1
118	23.4	21.5	50.85	38	3	89.1	63.88	68.3	66.5	118 77	.92	1
119	23.2	21 4	50 85	.38	3	89.1	64.35	68.5	66 6	119.76	.92	1
120	23 1	21.2	50.85	.38	3	89.1	64 81	68.7	66.8	120.76	92	1
121	22 9	21 1	50.85	.37	3	89.1	65.27	68.8	67.0	121.75	.92	1
122	22 7	20 9	50 86	.37	3	89 1	65.74	69 0	67.1	122.74	93	1
123	22 6	20.7	50 86	.37	3	89.1	66.20	69.1	67 3	123.74	.93	1
124	22 4	20.6	50 86	37	3	89 1	66.66	69.3	67 5	124.74	93	1
125	22 2	20.4	50.86	.36	3	89.1	67.13	69 4	67.6	125.73	93	1
126	22.1	20 3	50.86	.36	3	89.1	67 60	69.6	67 8	126.72	.93	1
127	21.9	20.1	50 87	.36	3	89.2	68.06	69.7	68.0	127 72	93	1
128	21.8	20.0	50.87	.35	3	89.2	68.53	69.9	68.1	128.71	.93	1
129	21 6	14.9	50.87	.35	3	89.2	69.00	70.0	68 3	129.71	.93	1
130	21.5	19.7	50.87	.35	3	89.2	69.46	70.2	68 4	130.71	.93	1
131	21 3	19.6	50.87	.35	3	89 2	69.93	70.3	68.6	131.70	.93	1
132	21 2	19.4	50.88	.35	3	89.2	70.40	70.5	68.7	132.70	.94	1

	PINION					PINION AND GEAR		GEAR				
50 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
50	46.6	43.2	51.41	.70	2	88.4	35.35					
51	46.0	42.6	51.43	.70	2	88.4	35.71	47.2	43.8	52.40	.71	2
52	45.4	42.1	51.44	69	2	88.4	36.07	47.7	44.4	53.39	.72	2
53	44.8	41.6	51.46	.68	2	88.4	36.43	48.2	44.9	54.37	.73	2
54	44.3	41.0	51.47	.68	2	88.4	36.80	48.7	45.5	55.36	.73	2
55	43.7	40.5	51.48	.67	2	88.5	37.16	49.3	46.0	56.34	.74	2
56	43.2	40.0	51.49	.66	2	88.5	37.54	49.8	46.5	57.33	.74	2
57	42.7	39.5	51.50	.66	2	88.5	37.91	50.2	47.1	58.32	.75	2
58	42.2	39.1	51.52	.65	2	88.5	38.29	50.7	47.6	59.30	76	2
59	41.7	38.6	51.53	.64	2	88.5	38.67	51.2	48.1	60.29	.76	2
60	41.2	38.1	51.54	.64	2	88.5	39.05	51.7	48.5	61.28	.77	2
61	40.7	37.7	51.55	63	2	88.5	39.44	52.1	49.0	62.27	.77	2
62	40.2	37.3	51.56	.62	2	88.6	39.82	52.5	49.5	63.25	.78	2
63	39.8	36.8	51.57	.62	2	88.6	40.21	53.0	50.0	64.24	.78	2
64	39.3	36.4	51.58	.61	2	88.6	40.61	53.4	50.4	65.23	.79	2
65	38.9	36.0	51.59	.61	2	88.6	41.00	53.8	50.9	66.22	.79	2
66	38.5	35.6	51.60	.60	2	88.6	41.40	54.2	51.3	67.21	.80	2
67	38.0	35.2	51.60	.60	2	88.6	41.80	54.6	51.7	68.20	80	2
68	37.6	34.8	51.61	.59	2	88.6	42.20	55.0	52.1	69.18	80	2
69	37.2	34.4	51.62	.58	2	88.7	42.60	55.4	52.6	70.17	.81	2
70	36.8	34.0	51.63	.58	2	88.7	43.01	55.8	53.0	71.16	.81	2
71	36.4	33.7	51.64	.57	2	88.7	43.42	56.2	53.4	72.15	.82	2
72	36.0	33.3	51.64	.57	2	88.7	43.83	56.5	53.7	73.14	.82	2
73	35.6	33.0	51.65	.56	2	88.7	44.24	56.9	54.1	74.13	82	2
74	35.3	32.6	51.66	.56	2	88.7	44.65	57.2	54.5	75.12	.83	2
75	34.9	32.3	51.67	.55	2	88.7	45.07	57.6	54.9	76.11	83	1
76	34.5	31.9	51.67	.55	2	88.7	45.49	57.9	55.2	77.10	83	1
77	34.2	31.6	51.68	.54	2	88.7	45.90	58.2	55.6	78.09	84	1
78	33.8	31.3	51.69	54	2	88.8	46.32	58.5	55.9	79.08	.84	1
79	33.5	31.0	51.69	.53	2	88.8	46.75	58.9	56.3	80.07	.84	1

	PINION					PINION AND GEAR		GEAR				
50 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
80	33.2	30.6	51.70	.53	2	88.8	47.17	59.2	56.6	81.06	.85	1
81	32.8	30.3	51.70	.52	2	88.8	47.59	59.5	57.0	82.05	.85	1
82	32.5	30.0	51.71	.52	2	88.8	48.02	59.8	57.3	83.04	.85	1
83	32.2	29.7	51.71	.51	2	88.8	48.45	60.1	57.6	84.03	.85	1
84	31.9	29.4	51.72	.51	2	88.8	48.88	60.4	57.9	85.02	.86	1
85	31.6	29.1	51.73	.50	2	88.8	49.31	60.7	58.2	86.01	.86	1
86	31.3	28.9	51.73	.50	2	88.8	49.74	61.0	58.5	87.01	.86	1
87	31.0	28.6	51.74	.50	2	88.9	50.17	61.2	58.8	88.00	.87	1
88	30.7	28.3	51.74	.49	2	88.9	50.61	61.5	59.1	88.99	.87	1
89	30.4	28.0	51.74	.49	2	88.9	51.04	61.8	59.4	89.98	.87	1
90	30.1	27.8	51.75	.48	2	88.9	51.48	62.0	59.7	90.97	.87	1
91	29.9	27.5	51.75	.48	2	88.9	51.91	62.3	60.0	91.96	.87	1
92	29.6	27.3	51.76	.48	2	88.9	52.35	62.5	60.2	92.96	.88	1
93	29.3	27.0	51.76	.47	2	88.9	52.79	62.8	60.5	93.95	.88	1
94	29.1	26.8	51.77	.47	2	88.9	53.23	63.0	60.8	94.94	.88	1
95	28.8	26.5	51.77	.46	2	88.9	53.68	63.3	61.0	95.93	.88	1
96	28.5	26.3	51.77	.46	2	88.9	54.12	63.5	61.3	96.92	.88	1
97	28.3	26.1	51.78	.46	2	88.9	54.56	63.8	61.6	97.92	.89	1
98	28.0	25.9	51.78	.45	2	89.0	55.01	64.0	61.8	98.91	.89	1
99	27.8	25.6	51.79	.45	2	89.0	55.45	64.2	62.0	99.90	.89	1
100	27.6	25.4	51.79	.45	2	89.0	55.90	64.4	62.3	100.90	.89	1
101	27.3	25.2	51.79	.44	2	89.0	56.35	64.7	62.5	101.89	.89	1
102	27.1	25.0	51.80	.44	2	89.0	56.80	64.9	62.7	102.88	.90	1
103	26.9	24.8	51.80	.43	2	89.0	57.25	65.1	63.0	103.87	.90	1
104	26.6	24.5	51.80	.43	2	89.0	57.70	65.3	63.2	104.87	.90	1
105	26.4	24.3	51.81	.43	2	89.0	58.15	65.5	63.5	105.86	.90	1
106	26.2	24.1	51.81	.42	2	89.0	58.60	65.7	63.7	106.85	.90	1
107	26.0	23.9	51.81	.42	2	89.0	59.05	65.9	63.9	107.85	.90	1
108	25.8	23.7	51.82	.42	2	89.0	59.51	66.1	64.1	108.84	.91	1
109	25.6	23.6	51.82	.42	2	89.0	59.96	66.3	64.3	109.84	.91	1

50 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
110	25.4	23.4	51.82	.41	2	89.0	60.42	66.5	64.5	110.83	.91	1
111	25.2	23.2	51.82	.41	2	89.1	60.87	66.7	64.7	111.82	.91	1
112	25.0	23.0	51.83	.41	2	89.1	61.33	66.9	64.9	112.82	.91	1
113	24.8	22.8	51.83	.40	3	89.1	61.78	67.0	65.1	113.81	.91	1
114	24.6	22.6	51.83	.40	3	89.1	62.24	67.2	65.3	114.81	.91	1
115	24.4	22 5	51.84	.40	3	89.1	62.70	67.4	65.5	115.80	.92	1
116	24.2	22.3	51 84	.39	3	89.1	63.16	67.6	65.7	116.79	.92	1
117	24.0	22.1	51.84	.39	3	89.1	63.62	67.8	65.9	117.79	.92	1
118	23 8	22.0	51.84	.39	3	89.1	64.08	67.9	66.0	118.78	.92	1
119	23.6	21.8	51.84	.39	3	89.1	64.54	68.1	66.2	119.78	.92	1
120	23 5	21.6	51.85	.38	3	89.1	65.00	68.2	66.4	120.77	.92	1
121	23 3	21.5	51.85	.38	3	89.1	65.46	68.4	66.6	121.76	.92	1
122	23 1	21.3	51.85	.38	3	89.1	65.92	68.6	66.7	122.76	.92	1
123	23 0	21.2	51.85	.37	3	89.1	66.39	68.7	66.9	123.75	.92	1
124	22.8	21.0	51.86	.37	3	89.1	66.85	68.9	67.1	124.75	.93	1
125	22 6	20.8	51.86	.37	3	89.1	67.32	69.0	67.2	125.74	.93	1
126	22 5	20.7	51.86	.37	3	89.2	67.78	69.2	67.4	126.74	.93	1
127	22 3	20.5	51.86	.36	3	89.2	68.24	69.3	67.6	127.73	.93	1
128	22 1	20 4	51.86	.36	3	89.2	68.71	69.5	67.7	128.73	.93	1
129	22 0	20.3	51.87	.36	3	89.2	69.18	69.6	67.9	129.72	.93	1
130	21.8	20.1	51.87	.36	3	89.2	69.64	69.8	68.0	130.72	.93	1
131	21.7	20.0	51.87	.35	3	89.2	70.11	69.9	68.2	131.71	.93	1
132	21.5	19.8	51.87	.35	3	89.2	70.58	70.0	68.3	132.71	.93	1

51 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
51	46.5	43.2	52.41	.70	2	88.4	36.06					
52	46.0	42.6	52.43	70	2	88.4	36.42	47.1	43.8	53.40	.71	2
53	45.4	42.1	52.44	.69	2	88.4	36.78	47.7	44.4	54.39	.72	2
54	44.8	41.6	52.45	.68	2	88.5	37.14	48.2	44.9	55.37	.72	2
55	44.3	41.1	52.47	.68	2	88.5	37.50	48.7	45.5	56.36	.73	2
56	43.8	40.6	52.48	.67	2	88.5	37.87	49.2	46.0	57.34	.74	2
57	43.2	40.1	52.49	.66	2	88.5	38.24	49.7	46.5	58.33	74	2
58	42.7	39.6	52.50	.66	2	88.5	38.62	50.1	47.0	59.32	.75	2
59	42.2	39.1	52.51	65	2	88.5	38.99	50.6	47.5	60.31	.75	2
60	41.8	38.7	52.52	.64	2	88.5	39.37	51.1	48.0	61.29	.76	2
61	41.3	38.2	52.54	.64	2	88.6	39.76	51.6	48.5	62.28	.77	2
62	40.8	37.8	52.55	.63	2	88.6	40.14	52.0	49.0	63.27	.77	2
63	40.3	37.4	52.56	.63	2	88.6	40.53	52.4	49.4	64.26	.78	2
64	39.9	36.9	52.56	.62	2	88.6	40.92	52.8	49.9	65.24	.78	2
65	39.4	36.5	52.57	.61	2	88.6	41.31	53.3	50.3	66.23	.78	2
66	39.0	36.1	52.58	.61	2	88.6	41.70	53.7	50.8	67.22	.79	2
67	38.6	35.7	52.59	.60	2	88.6	42.10	54.1	51.2	68.21	.79	2
68	38.2	35.3	52.60	.60	2	88.6	42.50	54.5	51.6	69.20	.80	2
69	37.7	34.9	52.61	.59	2	88.7	42.90	54.9	52.0	70.19	.80	2
70	37.3	34.6	52.62	.59	2	88.7	43.30	55.2	52.5	71.18	.81	2
71	36.9	34.2	52.63	.58	2	88.7	43.71	55.6	52.9	72.17	81	2
72	36.5	33.8	52.63	.58	2	88.7	44.12	56.0	53.3	73.16	81	2
73	36.2	33.5	52.64	.57	2	88.7	44.52	56.3	53.7	74.15	82	2
74	35.8	33.1	52.65	.56	2	88.7	44.93	56.7	54.1	75.13	.82	2
75	35.4	32.8	52.66	.56	2	88.7	45.35	57.0	54.5	76.12	.83	2
76	35.0	32.4	52.66	.55	2	88.7	45.76	57.4	54.8	77.11	83	1
77	34.7	32.1	52.67	.55	2	88.8	46.18	57.7	55.2	78.10	.83	1
78	34.4	31.8	52.68	.54	2	88.8	46.60	58.0	55.5	79.09	84	1
79	34.0	31.4	52.68	.54	2	88.8	47.02	58.4	55.8	80.08	.84	1
80	33.7	31.1	52.69	.53	2	88.8	47.44	58.7	56.1	81.07	.84	1

	PINION					PINION AND GEAR		GEAR				
51 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
81	33.3	30.8	52.69	.53	2	88.8	47.86	59.0	56.5	82.07	.84	1
82	33.0	30.5	52.70	.53	2	88.8	48.28	59.3	56.8	83.06	.85	1
83	32.7	30.2	52.71	.52	2	88.8	48.71	59.6	57.1	84.05	.85	1
84	32.4	29.9	52.71	.52	2	88.8	49.13	59.9	57.4	85.09	.85	1
85	32.1	29.6	52.72	.51	2	88.8	49.56	60.2	57.7	86.03	.86	1
86	31.8	29.3	52.72	.51	2	88.9	49.99	60.5	58.0	87.02	.86	1
87	31.5	29.0	52.73	.50	2	88.9	50.42	60.8	58.3	88.01	.86	1
88	31.2	28.8	52.73	.50	2	88.9	50.85	61.0	58.6	89.00	.86	1
89	30.9	28.5	52.74	.50	2	88.9	51.29	61.3	58.9	90.00	.87	1
90	30.6	28.3	52.74	.49	2	88.9	51.72	61.6	59.2	90.99	.87	1
91	30.3	28.0	52.75	.49	2	88.9	52.16	61.8	59.5	91.98	.87	1
92	30.0	27.7	52.75	.48	2	88.9	52.60	62.1	59.8	92.97	.87	1
93	29.8	27.5	52.75	.48	2	88.9	53.03	62.4	60.1	93.96	.87	1
94	29.5	27.2	52.76	.47	2	88.9	53.47	62.6	60.3	94.95	.88	1
95	29.2	27.0	52.76	.47	2	88.9	53.91	62.9	60.6	95.95	.88	1
96	29.0	26.8	52.77	.47	2	88.9	54.35	63.1	60.8	96.94	.88	1
97	28.7	26.5	52.77	.46	2	89.0	54.79	63.3	61.1	97.93	.88	1
98	28.5	26.3	52.77	.46	2	89.0	55.24	63.6	61.3	98.92	.88	1
99	28.2	26.1	52.78	.46	2	89.0	55.68	63.8	61.6	99.92	.89	1
100	28.0	25.9	52.78	.45	2	89.0	56.13	64.0	61.8	100.91	.89	1
101	27.7	25.6	52.79	.45	2	89.0	56.57	64.2	62.1	101.90	.89	1
102	27.5	25.4	52.79	.45	2	89.0	57.02	64.5	62.3	102.90	.89	1
103	27.3	25.2	52.79	.44	2	89.0	57.47	64.3	62.5	103.89	.89	1
104	27.0	25.0	52.80	.44	2	89.0	57.92	64.9	62.8	104.88	.90	1
105	26.8	24.8	52.80	.43	2	89.0	58.36	65.1	63.0	105.87	.90	1
106	26.6	24.6	52.80	.43	2	89.0	58.82	65.3	63.2	106.87	.90	1
107	26.4	24.4	52.81	.43	2	89.0	59.27	65.5	63.5	107.86	.90	1
108	26.2	24.2	52.81	.43	2	89.0	59.72	65.7	63.7	108.86	.90	1
109	26.0	24.0	52.81	.42	2	89.0	60.17	65.9	63.9	109.85	.90	1
110	25.8	23.8	52.82	.42	2	89.1	60.62	66.1	64.1	110.84	.91	1

51 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
111	25.6	23.6	52.82	.42	2	89.1	61.08	66.3	64.3	111.84	.91	1
112	25.4	23.4	52.82	.41	2	89.1	61.53	66.5	64.5	112.83	.91	1
113	25.2	23.2	52.82	.41	2	89.1	61.99	66.6	64.7	113.83	.91	1
114	25.0	23.0	52.83	.41	2	89.1	62.44	66.8	64.9	114.82	.91	1
115	24.8	22.9	52.83	.40	2	89.1	62.90	67.0	65.1	115.81	.91	1
116	24.6	22.7	52.83	.40	2	89.1	63.36	67.2	65.3	116.81	.91	1
117	24.4	22.5	52.83	.40	2	89.1	63.81	67.4	65.5	117.80	.91	1
118	24.2	22.4	52.84	.39	2	89.1	64.27	67.5	65.6	118.79	.92	1
119	24.0	22.2	52.84	.39	2	89.1	64.73	67.7	65.8	119.79	.92	1
120	23.9	22.0	52.84	.39	2	89.1	65.19	67.9	66.0	120.78	.92	1
121	23.7	21.9	52.84	.39	2	89.1	65.65	68.0	66.2	121.78	.92	1
122	23.5	21.7	52.85	.38	2	89.1	66.12	68.2	66.4	122.77	.92	1
123	23.3	21.5	52.85	.38	2	89.1	66.58	68.3	66.5	123.77	.92	1
124	23.2	21.4	52.85	.38	2	89.1	67.04	68.5	66.7	124.76	.92	1
125	23.0	21.2	52.85	.38	2	89.1	67.50	68.7	66.9	125.76	.92	1
126	22.8	21.1	52.85	.37	2	89.2	67.96	68.8	67.0	126.75	.92	1
127	22.7	20.9	52.86	.37	2	89.2	68.43	69.0	67.2	127.75	.93	1
128	22.5	20.8	52.86	.37	2	89.2	68.89	69.1	67.4	128.74	.93	1
129	22.4	20.6	52.86	.37	2	89.2	69.36	69.3	67.5	129.74	.93	1
130	22.2	20.5	52.86	.36	2	89.2	69.82	69.4	67.7	130.73	.93	1
131	22.1	20.3	52.86	.36	3	89.2	70.29	69.5	67.8	131.73	.93	1
132	21.9	20.2	52.87	.36	3	89.2	70.76	69.7	68.0	132.72	.93	1

	PINION					PINION AND GEAR		GEAR				
52 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
52	46.5	43.2	53.41	.70	2	88.4	36.77					
53	46.0	42.7	53.43	.70	2	88.5	37.12	47.1	43.8	5440	.71	2
54	45.4	42.2	53.44	.69	2	88.5	37.48	47.6	44.4	55.39	.72	2
55	44.8	41.7	53.45	.68	2	88.5	37.84	48.1	44.9	56.37	.72	2
56	44.3	41.2	53.47	.68	2	88.5	38.21	48.6	45.4	57.86	.73	2
57	43.8	40.7	53.48	.67	2	88.5	38.58	49.1	46.0	58.35	.74	2
58	43.3	40.2	53.49	.66	2	88.5	38.95	49.6	46.5	59.33	.74	2
59	42.8	39.7	53.50	.66	2	88.5	39.32	50.0	47.0	60.32	.75	2
60	42.3	39.3	53.51	.65	2	88.6	3970	50.5	47.5	61.31	.75	2
61	41.8	38.8	53.52	.65	2	88.6	40.08	51.0	48.0	62.30	.76	2
62	41.4	38.4	53.53	.64	2	88.6	40.46	51 4	48.4	63.28	.76	2
63	40.9	37.9	53.54	.64	2	88.6	40.84	51.9	48.9	64.27	.77	2
64	40.4	37.5	53.55	.63	2	88.6	41.23	52.3	49.3	65.26	.77	2
65	40.0	37.1	53.56	.62	2	88.6	41.62	52.7	49.8	66.25	.78	2
66	39.6	36.7	53.57	.62	2	88 6	42.01	53.1	50 2	67.24	.78	2
67	39.1	36.3	53.58	.61	2	88.6	4240	53.5	50.7	68.22	.79	2
68	38.7	35.9	53.59	.60	2	88.7	42.80	53.9	51.1	69.21	.79	2
69	38.3	35.5	53.60	.60	2	88.7	43.20	54.3	51.5	70.20	.80	2
70	37.9	35.1	53.61	.59	2	88.7	43.60	54.7	51.9	71.19	.80	2
71	37.5	34.7	53.62	.59	2	88.7	4400	55.0	52 3	72.18	81	2
72	37.1	34.4	53.62	.58	2	88.7	4441	55.4	52 7	73.17	81	2
73	36.7	34.0	53.63	.58	2	88.7	4481	55.8	53.1	74.16	.81	2
74	36.3	33.6	53.64	.57	2	88.7	45.22	56.2	53.5	75.15	.82	2
75	36.0	33.3	53.65	.57	2	88.7	45.63	56.5	53.9	76.14	82	2
76	35.6	33.0	53.65	.56	2	88.8	46.04	56.9	54.2	77.13	.82	1
77	35.2	32.6	53.66	.56	2	88.8	46.46	57 2	54.6	78.12	83	1
78	34.9	32.3	53.67	.55	2	88 8	46.87	57.5	54.9	79.11	83	1
79	34.5	32.0	53.67	.55	2	88 8	47.29	57 8	55.3	80.10	83	1
80	34.2	31.7	53.68	.54	2	88 8	4771	58.2	55.6	81 09	.84	1
81	33.9	31.3	53.69	.54	2	88.8	48.13	58.5	56.0	82.08	.84	1

52 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
82	33.5	31.0	53.69	.53	2	88.8	48.55	58.8	56.3	83.07	.84	1
83	33.2	30.7	53.70	.53	2	88.8	48.97	59.1	56.6	84.06	.85	1
84	32.9	30.4	53.70	.52	2	88.8	49.40	59.4	56.9	85.05	.85	1
85	32.6	30.1	53.71	.52	2	88.8	49.82	59.7	57.2	86.04	.85	1
86	32.3	29.9	53.71	.52	2	88.9	50.25	60.0	57.5	87.04	.85	1
87	32.0	29.6	53.72	.51	2	88.9	50.68	60.3	57.8	88.03	.86	1
88	31.7	29.3	53.72	.51	2	88.9	51.11	60.5	58.1	89.02	.86	1
89	31.4	29.0	53.73	.50	2	88.9	51.54	60.8	58.4	90.01	.86	1
90	31.1	28.8	53.73	.50	2	88.9	51.97	61.1	58.7	91.00	.86	1
91	30.8	28.5	53.74	.49	2	88.9	52.40	61.4	59.0	91.99	.87	1
92	30.5	28.2	53.74	.49	2	88.9	52.84	61.6	59.3	92.99	.87	1
93	30.3	28.0	53.75	.49	2	88.9	53.27	61.9	59.6	93.98	.87	1
94	30.0	27.7	53.75	.48	2	88.9	53.71	62.1	59.8	94.97	.87	1
95	29.7	27.5	53.76	.48	2	88.9	54.15	62.4	60.1	95.96	.88	1
96	29.5	27.2	53.76	.47	2	88.9	54.59	62.6	60.4	96.95	88	1
97	29.2	27.0	53.76	.47	2	89.0	55.03	62.9	60.6	97.94	.88	1
98	29.0	26.8	53.77	.47	2	89.0	55.47	63.1	60.9	98.94	.88	1
99	28.7	26.5	53.77	.46	2	89.0	55.91	63.3	61.1	99.93	.88	1
100	28.5	26.3	53.77	.46	2	89.0	56.36	63.5	61.4	100.92	.88	1
101	28.2	26.1	53.78	.46	2	89.0	56.80	63.8	61.6	101.92	.89	1
102	28.0	25.9	53.78	.45	2	89.0	57.29	64.0	61.9	102.91	.89	1
103	27.7	25.7	53.79	.45	2	89.0	57.69	64.2	62.1	103.90	89	1
104	27.5	25.4	53.79	.45	2	89.0	58.14	64.4	62.3	104.90	.89	1
105	27.3	25.2	53.79	.44	2	89.0	58.59	64.6	62.5	105.89	.89	1
106	27.1	25.0	53.80	.44	2	89.0	59.03	64.8	62.8	106.88	.90	1
107	26.9	24.8	53.80	.43	2	89.0	59.48	65.0	63.0	107.87	.90	1
108	26.7	24.6	53.80	.43	2	89.0	59.93	65.2	63.2	108.87	.90	1
109	26.4	24.4	53.81	.43	2	89.0	60.38	65.5	63.4	109.86	.90	1
110	26.2	24.2	53.81	.43	2	89.1	60.84	65.7	63.6	110.86	.90	1
111	26.0	24.0	53.81	.42	2	89.1	61.29	65.9	63.8	111.85	.90	1

	PINION					PINION AND GEAR		GEAR				
52 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
112	25.8	23.8	53.81	.42	2	89.1	61.74	66.0	64.0	112.84	.90	1
113	25.6	23.7	53.82	.42	2	89.1	62.20	66.2	64.2	113.84	.91	1
114	25.4	23.5	53.82	.41	2	89.1	62.65	66.4	64.4	114.83	.91	1
115	25.2	23.3	53.82	.41	2	89.1	63.10	66.6	64.6	115.83	.91	1
116	25.0	23.1	53.83	.41	2	89.1	63.56	66.8	64.8	116.82	.91	1
117	24.8	22.9	53.83	.40	2	89.1	64.02	66.9	65.0	117.81	.91	1
118	24.7	22.8	53.83	.40	2	89.1	64.47	67.1	65.2	118.81	.91	1
119	24.5	22.6	53.83	.40	2	89.1	64.93	67.3	65.4	119.80	.91	1
120	24.3	22.4	53.84	.40	2	89.1	65.39	67.4	65.6	120.80	.92	1
121	24.1	22.3	53.84	.39	2	89.1	65.85	67.6	65.8	121.79	.92	1
122	23.9	22.1	53.84	.39	2	89.1	66.31	67.8	65.9	122.79	.92	1
123	23.8	21.9	53.84	.39	2	89.1	66.77	67.9	66.1	123.78	.92	1
124	23.6	21.8	53.85	.38	2	89.1	67.23	68.1	66.3	124.77	.92	1
125	23.4	21.6	53.85	.38	2	89.2	67.69	68.3	66.5	125.77	.92	1
126	23.3	21.5	53.85	.38	2	89.2	68.16	68.4	66.6	126.76	.92	1
127	23.1	21.3	53.85	.38	2	89.2	68.62	68.6	66.8	127.76	.92	1
128	22.9	21.2	53.85	.37	2	89.2	69.08	68.7	67.0	128.75	.92	1
129	22.8	21.0	53.86	.37	2	89.2	69.54	68.9	67.1	129.75	.93	1
130	22.6	20.9	53.86	.37	2	89.2	70.00	69.0	67.3	130.74	.93	1
131	22.5	20.8	53.86	.37	2	89.2	70.47	69.2	67.4	131.74	.93	1
132	22.3	20.6	53.86	.36	2	89.2	70.94	69.3	67.6	132.73	.93	1

	PINION					PINION AND GEAR		GEAR				
53 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
53	46.5	43.2	54.41	.70	2	88.5	37.48					
54	45.9	42.7	54.43	.70	2	88.5	37.83	47.1	43.8	55.40	.71	2
55	45.4	42.2	54.44	.69	2	88.5	38.19	47.6	44.4	56.39	.72	2
56	44.9	41.7	54.45	.68	2	88.5	38.55	48.1	44.9	57.37	.72	2
57	44.3	41.2	54.46	.68	2	88.5	38.92	48.6	45.5	58.36	.73	2
58	43.8	40.7	54.48	.67	2	88.5	39.28	49.0	46.0	59.35	.74	2
59	43.3	40.3	54.49	.66	2	88.6	39.65	49.5	46.5	60.33	.74	2
60	42.8	39.8	54.50	.66	2	88.6	40.03	50.0	47.0	61.32	.75	2
61	42.3	39.3	54.51	.65	2	88.6	40.40	50.4	47.5	62.31	.75	2
62	41.9	38.9	54.52	.65	2	88.6	40.78	50.9	47.9	63.30	.76	2
63	41.4	38.5	54.53	.64	2	88.6	41.16	51.3	48.4	64.29	.76	2
64	41.0	38.0	54.54	.63	2	88.6	41.55	51.7	48.8	65.27	.77	2
65	40.5	37.6	54.55	.63	2	88.6	41.93	52.1	49.3	66.26	.77	2
66	40.1	37.2	54.56	.62	2	88.6	42.32	52.6	49.7	67.25	.78	2
67	39.7	36.8	54.57	.62	2	88.7	42.71	53.0	50.2	68.24	78	2
68	39.2	36.4	54.58	.61	2	88.7	43.11	53.4	50.6	69.23	.79	2
69	38.8	36.0	54.59	.61	2	88.7	43.50	53.8	51.0	70.22	79	2
70	38.4	35.6	54.60	.60	2	88.7	43.90	54.2	51.4	71.20	.80	2
71	38.0	35.3	54.60	.59	2	88.7	44.30	54.5	51.8	72.19	.80	2
72	37.6	34.9	54.61	.59	2	88.7	44.70	54.9	52.2	73.18	.80	2
73	37.2	34.5	54.62	.58	2	88.7	45.10	55.3	52.6	74.17	81	2
74	36.8	34.2	54.63	.58	2	88.7	45.51	55.6	53.0	75.16	81	2
75	36.5	33.8	54.64	.57	2	88.7	45.92	56.0	53.3	76.15	.82	2
76	36.1	33.5	54.64	.57	2	88.8	46.33	56.3	53.7	77.14	.82	2
77	35.7	33.1	54.65	.56	2	88.8	46.74	56.7	54.1	78.13	.82	1
78	35.4	32.8	54.66	.56	2	88.8	47.15	57.0	54.4	79.12	83	1
79	35.0	32.5	54.66	.55	2	88.8	47.56	57.3	54.8	80.11	.83	1
80	34.7	32.1	54.67	.55	2	88.8	47.98	57.7	55.1	81.10	83	1
81	34.3	31.8	54.68	.54	2	88.8	48.40	58.0	55.5	82.09	84	1
82	34.0	31.5	54.68	.54	2	88.8	48.82	58.3	55.8	83.09	.84	1

53 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
83	33.7	31.2	54.69	.54	2	88.8	49.24	58.6	56.1	84.08	.84	1
84	33.4	31.0	54.69	.53	2	88.8	49.66	58.9	56.4	85.07	.84	1
85	33.1	30.7	54.70	.53	2	88.9	50.08	59.2	56.8	86.06	.85	1
86	32.8	30.4	54.70	.52	2	88.9	50.51	59.5	57.1	87.05	.85	1
87	32.5	30.1	54.71	.52	2	88.9	50.93	59.8	57.4	88.04	.85	1
88	32.2	29.8	54.71	.51	2	88.9	51.36	60.0	57.7	89.03	.85	1
89	31.9	29.5	54.72	.51	2	88.9	51.79	60.3	58.0	90.02	.86	1
90	31.6	29.2	54.72	.51	2	88.9	52.22	60.6	58.2	91.02	.86	1
91	31.3	29.0	54.73	.50	2	88.9	52.65	60.9	58.5	92.01	.86	1
92	31.0	28.7	54.73	.50	2	88.9	53.09	61.1	58.8	93.00	.86	1
93	30.7	28.5	54.74	.49	2	88.9	53.52	61.4	59.1	93.99	.87	1
94	30.5	28.2	54.74	.49	2	88.9	53.95	61.6	59.4	94.98	.87	1
95	30.2	27.9	54.75	.49	2	88.9	54.39	61.9	59.6	95.98	.87	1
96	29.9	27.7	54.75	.48	2	89.0	54.83	62.1	59.9	96.97	.87	1
97	29.7	27.5	54.76	.48	2	89.0	55.27	62.4	60.2	97.96	.88	1
98	29.4	27.2	54.76	.47	2	89.0	55.71	62.6	60.4	98.95	.88	1
99	29.1	27.0	54.76	.47	2	89.0	56.15	62.9	60.7	99.94	.88	1
100	28.9	26.8	54.77	.47	2	89.0	56.59	63.1	60.9	100.94	.88	1
101	28.7	26.5	54.77	.46	2	89.0	57.03	63.3	61.2	101.93	.88	1
102	28.4	26.3	54.78	.46	2	89.0	57.47	63.5	61.4	102.92	.89	1
103	28.2	26.1	54.78	.46	2	89.0	57.92	63.8	61.7	103.92	.89	1
104	27.9	25.9	54.78	.45	2	89.0	58.36	64.0	61.9	104.91	.89	1
105	27.7	25.7	54.79	.45	2	89.0	58.81	64.2	62.1	105.90	.89	1
106	27.5	25.5	54.79	.45	2	89.0	59.26	64.4	62.4	106.90	.89	1
107	27.3	25.2	54.79	.44	2	89.0	59.70	64.6	62.6	107.89	.89	1
108	27.0	25.0	54.80	.44	2	89.0	60.15	64.8	62.8	108.88	.90	1
109	26.8	24.9	54.80	.44	2	89.1	60.60	65.0	63.0	109.88	.90	1
110	26.6	24.7	54.80	.43	2	89.1	61.05	65.2	63.2	110.87	.90	1
111	26.4	24.5	54.81	.43	2	89.1	61.50	65.4	63.4	111.86	.90	1
112	26.2	24.3	54.81	.43	2	89.1	61.95	65.6	63.6	112.86	.90	1

	PINION					PINION AND GEAR		GEAR				
53 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
113	26.0	24.1	54.81	.42	2	89.1	62.41	65.8	63.8	113.85	.90	1
114	25.8	23.9	54.81	.42	2	89.1	62.86	66.0	64.0	114.84	.90	1
115	25.6	23.7	54.82	.42	2	89.1	63.31	66.2	64.2	115.84	.91	1
116	25.4	23.5	54.82	.41	2	89.1	63.76	66.4	64.4	116.83	.91	1
117	25.2	23.4	54.82	.41	2	89.1	64.22	66.5	64.6	117.83	.91	1
118	25.0	23.2	54.83	.41	2	89.1	64.68	66.7	64.8	118.82	.91	1
119	24.8	23.0	54.83	.41	2	89.1	65.13	66.9	65.0	119.82	.91	1
120	24.7	22.8	54.83	.40	2	89.1	65.59	67.0	65.2	120.81	.91	1
121	24.5	22.7	54.83	.40	2	89.1	66.05	67.2	65.4	121.80	.91	1
122	24.3	22.5	54.84	.40	2	89.1	66.51	67.4	65.5	122.80	.92	1
123	24.1	22.3	54.84	.39	2	89.1	66.96	67.5	65.7	123.79	.92	1
124	24.0	22.2	54.84	.39	2	89.1	67.42	67.7	65.9	124.79	.92	1
125	23.8	22.0	54.84	.39	2	89.2	67.88	67.9	66.1	125.78	.92	1
126	23.6	21.9	54.84	.39	2	89.2	68.34	68.0	66.2	126.78	.92	1
127	23.4	21.7	54.85	.38	2	89.2	68.81	68.2	66.4	127.77	.92	1
128	23.3	21.6	54.85	.38	2	89.2	69.27	68.3	66.6	128.77	.92	1
129	23.1	21.4	54.85	.38	2	89.2	69.73	68.5	66.7	129.76	.92	1
130	23.0	21.2	54.85	.38	2	89.2	70.20	68.6	66.9	130.76	.92	1
131	22.8	21.1	54.85	.37	2	89.2	70.66	68.8	67.1	131.75	.92	1
132	22.6	21.0	54.86	.37	2	89.2	71.12	68.9	67.2	132.74	.93	1

54	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
54	46.4	43.3	55.41	.70	2	88.5	38.18					
55	45.9	42.8	55.43	.70	2	88.5	38.54	47.0	43.8	56.40	.71	2
56	45.4	42.3	55.44	.69	2	88.5	38.90	47.5	44.4	57.39	.72	2
57	44.9	41.8	55.45	.68	2	88.5	39.26	48.0	44.9	58.37	.72	2
58	44.4	41.3	55.46	.68	2	88.6	39.62	48.5	45.4	59.36	.73	2
59	43.9	40.8	55.48	.67	2	88.6	39.99	49.0	45.9	60.35	.74	2
60	43.4	40.4	55.49	.67	2	88.6	40.36	49.4	46.4	61.34	.74	2
61	42.9	39.9	55.50	.66	2	88.6	40.73	49.9	46.9	62.32	.75	2
62	42.4	39.5	55.51	.65	2	88.6	41.11	50.3	47.4	63.31	.75	2
63	42.0	39.0	55.52	.65	2	88.6	41.49	50.8	47.9	64.30	.76	2
64	41.5	38.6	55.53	.64	2	88.6	41.87	51.2	48.3	65.29	.76	2
65	41.0	38.2	55.54	.64	2	88.6	42.25	51.6	48.7	66.28	.77	2
66	40.6	37.8	55.55	.63	2	88.7	42.64	52.0	49.2	67.26	.77	2
67	40.1	37.4	55.56	.62	2	88.7	43.03	52.5	49.6	68.25	.78	2
68	39.7	37.0	55.57	.62	2	88.7	43.42	52.9	50.0	69.24	.78	2
69	39.3	36.6	55.58	.61	2	88.7	43.81	53.2	50.5	70.23	.79	2
70	38.9	36.2	55.59	.61	2	88.7	44.20	53.6	50.9	71.22	.79	2
71	38.5	35.8	55.59	.60	2	88.7	44.60	54.0	51.3	72.21	.79	2
72	38.1	35.4	55.60	.60	2	88.7	45.00	54.4	51.7	73.20	.80	2
73	37.7	35.1	55.61	.59	2	88.7	45.40	54.8	52.0	74.19	.80	2
74	37.3	34.7	55.62	.59	2	88.7	45.80	55.1	52.5	75.18	.81	2
75	37.0	34.4	55.63	.58	2	88.8	46.21	55.5	52.8	76.17	.81	2
76	36.6	34.0	55.63	.58	2	88.8	46.62	55.8	53.2	77.16	.81	2
77	36.2	33.7	55.64	.57	2	88.8	47.02	56.1	53.6	78.15	.82	1
78	35.9	33.3	55.65	.57	2	88.8	47.43	56.5	53.9	79.14	.82	1
79	35.5	33.0	55.65	.56	2	88.8	47.84	56.8	54.3	80.13	.82	1
80	35.2	32.7	55.66	.56	2	88.8	48.26	57.2	54.6	81.12	.83	1
81	34.8	32.4	55.67	.55	2	88.8	48.67	57.5	55.0	82.11	.83	1
82	34.5	32.0	55.67	.55	2	88.8	49.09	57.8	55.3	83.10	.83	1
83	34.2	31.7	55.68	.54	2	88.8	49.51	58.1	55.6	84.09	.84	1

54 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
84	33.9	31.5	55.68	.54	2	88.8	49.93	58.4	56.0	85.08	.84	1
85	33.5	31.2	55.69	.53	2	88.9	50.35	58.7	56.3	86.07	.84	1
86	33.2	30.9	55.70	.53	2	88.9	50.77	59.0	56.6	87.06	.85	1
87	32.9	30.6	55.70	.53	2	88.9	51.20	59.3	56.9	88.06	.85	1
88	32.6	30.3	55.71	.52	2	88.9	51.62	59.5	57.2	89.05	.85	1
89	32.3	30.0	55.71	.52	2	88.9	52.05	59.8	57.5	90.04	.85	1
90	32.0	29.7	55.72	.51	2	88.9	52.48	60.1	57.8	91.03	.86	1
91	31.7	29.5	55.72	.51	2	88.9	52.91	60.4	58.1	92.02	.86	1
92	31.5	29.2	55.73	.50	2	88.9	53.34	60.6	58.4	93.01	.86	1
93	31.2	28.9	55.73	.50	2	88.9	53.77	60.9	58.7	94.01	.86	1
94	30.9	28.7	55.74	.50	2	88.9	54.20	61.2	58.9	95.00	.87	1
95	30.6	28.4	55.74	.49	2	88.9	54.64	61.4	59.2	95.99	.87	1
96	30.4	28.2	55.74	.49	2	89.0	55.07	61.7	59.5	96.98	.87	1
97	30.1	27.9	55.75	.48	2	89.0	55.51	61.9	59.7	97.97	.87	1
98	29.9	27.7	55.75	.48	2	89.0	55.95	62.1	60.0	98.97	.87	1
99	29.6	27.5	55.76	.48	2	89.0	56.38	62.4	60.2	99.96	.88	1
100	29.4	27.2	55.76	.47	2	89.0	56.82	62.6	60.5	100.95	.88	1
101	29.1	27.0	55.76	.47	2	89.0	57.28	62.9	60.7	101.94	.88	1
102	28.9	26.8	55.77	.47	2	89.0	57.71	63.1	61.0	102.94	.88	1
103	28.6	26.5	55.77	.46	2	89.0	58.15	63.3	61.2	103.93	.88	1
104	28.4	26.3	55.78	.46	2	89.0	58.59	63.5	61.5	104.92	.89	1
105	28.2	26.1	55.78	.46	2	89.0	59.04	63.8	61.7	105.92	.89	1
106	27.9	25.9	55.78	.45	2	89.0	59.48	64.0	61.9	106.91	.89	1
107	27.7	25.7	55.79	.45	2	89.0	59.93	64.2	62.2	107.90	.89	1
108	27.5	25.5	55.79	.45	2	89.0	60.37	64.4	62.4	108.90	.89	1
109	27.3	25.3	55.79	.44	2	89.1	60.82	64.6	62.6	109.89	.89	1
110	27.0	25.1	55.80	.44	2	89.1	61.27	64.8	62.8	110.89	.90	1
111	26.8	24.9	55.80	.44	2	89.1	61.72	65.0	63.0	111.88	90	1
112	26.6	24.7	55.80	.43	2	89.1	62.17	65.2	63.2	112.87	90	1
113	26.4	24.5	55.80	.43	2	89.1	62.62	65.4	63.4	113.86	.90	1

54 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
114	26.2	24.3	55.81	.43	2	89.1	63.07	65.6	63.6	114.86	90	1
115	26.0	24.1	55.81	.42	2	89.1	63.52	65.8	63.8	115.85	.90	1
116	25.8	24.0	55.81	.42	2	89.1	63.98	65.9	64.0	116.85	.90	1
117	25.6	23.8	55.82	.42	2	89.1	64.43	66.1	64.2	117.84	.91	1
118	25.4	23.6	55.82	.41	2	89.1	64.88	66.3	64.4	118.83	.91	1
119	25.2	23.4	55.82	.41	2	89.1	65.34	66.5	64.6	119.83	.91	1
120	25.1	23.2	55.83	.41	2	89.1	65.79	66.6	64.8	120.82	.91	1
121	24.9	23.1	55.83	.41	2	89 1	66.25	66.8	65.0	121.82	.91	1
122	24.7	22.9	55.83	.40	2	89.1	66.71	67.0	65.2	122.81	91	1
123	24.5	22.7	55.83	.40	2	89.1	67.16	67.1	65.3	123.81	.91	1
124	24.3	22.6	55.83	.40	2	89.1	67.62	67.3	65.5	124.80	.91	1
125	24.2	22.4	55.84	.39	2	89.2	68.08	67.5	65.7	125.79	.92	1
126	24.0	22.2	55.84	.39	2	89.2	68.54	67.6	65.9	126.79	.92	1
127	23.8	22.1	55.84	.39	2	89.2	69.00	67.8	66.0	127.78	.92	1
128	23.7	21.9	55.84	.39	2	89.2	69.46	67.9	66.2	128.78	.92	1
129	23.5	21.8	55.85	.38	2	89.2	69.92	68.1	66.4	129.77	.92	1
130	23 3	21.6	55.85	.38	2	89.2	70.38	68.3	66.6	130.77	.92	1
131	23.2	21.5	55.85	.38	2	89.2	70.84	68.4	66.7	131.76	.92	1
132	23.0	21.3	55.85	.38	2	89 2	7131	68.6	66.8	132.76	.92	1

55 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
55	46.4	43.3	56.41	.70	2	88.5	38.89					
56	45.9	42.8	5643	.70	2	88.5	39.25	47.0	43.9	57.40	.71	2
57	45.4	42.3	56.44	.69	2	88.5	39.60	47.5	44.4	58.39	.72	2
58	44.9	41.9	56.45	.69	2	88.6	39.96	48.0	44.9	59.38	.72	2
59	44.4	41.4	56.46	.68	2	88.6	40.33	48.4	45.4	60.36	.73	2
60	43.9	40.9	56.47	.67	2	88.6	40.70	48.9	45.9	61.35	73	2
61	43.4	40.5	56.49	.67	2	88.6	41.07	49.3	46.4	62.34	.74	2
62	42.9	40.0	56.50	.66	2	88.6	41.44	49.8	46.9	63.33	.75	2
63	42.4	39.5	56.51	.65	2	88.6	41.81	50.2	47.4	64.31	.75	2
64	42.0	39.1	56.52	.65	2	88.6	42.19	50.7	47.8	65.30	.76	2
65	41.5	38.7	56.53	.64	2	88.7	42.57	51.1	48.2	66.29	.76	2
66	41.1	38.3	56.54	64	2	88.7	42.96	51.5	48.7	67.28	.77	2
67	40.7	37.9	56.55	.63	2	88.7	43.39	51.9	49.1	68.27	.77	2
68	40.2	37.5	56.55	.63	2	88.7	43.73	52.3	49.5	69.26	.77	2
69	39.8	37.1	56.56	.62	2	88.7	44.12	52.7	50.0	70.25	.78	2
70	39.4	36.7	56.57	.61	2	88.7	44.51	53.1	50.4	71.23	.78	2
71	39.0	36.3	56.58	.61	2	88.7	44.90	53.5	50.8	72.22	.79	2
72	38.6	36.0	56.59	.60	2	88.7	45.30	53.9	51.2	73.21	.79	2
73	38.2	35.6	56.60	.60	2	88.7	45.70	54.2	51.6	74.20	.80	2
74	37.8	35.2	56.61	.59	2	88.8	46.10	54.6	52.0	75.19	.80	2
75	37.4	34.9	56.61	.59	2	88.8	46.50	55.0	52.4	76.18	.80	2
76	37.1	34.5	56.62	.58	2	88.8	46.91	55.5	52.7	77.17	.81	2
77	36.7	34.2	56.63	.58	2	88.8	47.31	55.8	53.1	78.16	.81	2
78	36.4	33.8	56.64	.57	2	88.8	47.72	56.0	53.5	79.15	.82	1
79	36.0	33.5	56.64	.57	2	88.8	48.13	56.3	53.8	80.14	.82	1
80	35.7	33.2	56.65	.56	2	88.8	48.54	56.7	54.1	81.13	.82	1
81	35.3	32.8	56.66	.56	2	88.8	48.95	57.0	54.5	82.12	.83	1
82	35.0	32.5	56.66	.55	2	88.8	49.37	57.3	54.8	83.11	.83	1
83	34.6	32.2	56.67	.55	2	88.8	49.78	57.6	55.2	84.10	.83	1
84	34.3	31.9	56.68	.54	2	88.9	50.20	57.9	55.5	85.09	.84	1

55 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
85	34.0	31.6	56.68	.54	2	88.9	50.62	58.2	55.8	86.09	.84	1
86	33.7	31.3	56.69	.54	2	88.9	51.04	58.5	56.1	87.08	.84	1
87	33.4	31.0	56.69	.53	2	88.9	51.46	58.8	56.5	88.07	.84	1
88	33.1	30.8	56.70	.53	2	88.9	51.89	59.1	56.8	89.06	.85	1
89	32.8	30.5	56.70	.52	2	88.9	52.31	59.4	57.1	90.05	.85	1
90	32.5	30.2	56.71	.52	2	88.9	52.74	59.7	57.4	91.04	.85	1
91	32.2	29.9	56.71	.52	2	88.9	53.16	59.9	57.7	92.04	.85	1
92	31.9	29.6	56.72	.51	2	88.9	53.59	60.2	57.9	93.03	.86	1
93	31.6	29.4	56.72	.51	2	88.9	54.02	60.5	58.2	94.02	.86	1
94	31.3	29.1	56.73	.50	2	88.9	54.45	60.7	58.5	95.01	.86	1
95	31.1	28.9	56.73	.50	2	89.0	54.88	61.0	58.8	96.00	.86	1
96	30.8	28.6	56.74	.50	2	89.0	55.32	61.2	59.0	97.00	.87	1
97	30.5	28.4	56.74	.49	2	89.0	55.75	61.5	59.3	97.99	.87	1
98	30.3	28.1	56.75	.49	2	89.0	56.19	61.7	59.5	98.98	.87	1
99	30.0	27.9	56.75	.48	2	89.0	56.62	62.0	59.8	99.97	.87	1
100	29.8	27.7	56.75	.48	2	89.0	57.06	62.2	60.0	100.96	.87	1
101	29.5	27.4	56.76	48	2	89.0	57.50	62.4	60.3	101.96	.88	1
102	29.3	27.2	56.76	.47	2	89.0	57.94	62.7	60.6	102.95	.88	1
103	29.0	27.0	56.77	.47	2	89.0	58.38	62.9	60.8	103.94	.88	1
104	28.8	26.8	56.77	.47	2	89.0	58.82	63.1	61.0	104.94	.88	1
105	28.6	26.5	56.77	.46	2	89.0	59.27	63.3	61.3	105.93	.88	1
106	28.3	26.3	56.78	.46	2	89.0	59.71	63.5	61.5	106.92	.89	1
107	28.1	26.1	56.78	.45	2	89.0	60.15	63.9	61.7	107.91	.89	1
108	27.9	25.9	56.78	.45	2	89.1	60.60	64.0	62.0	108.91	.89	1
109	27.7	25.7	56.79	.45	2	89.1	61.04	64.2	62.2	109.90	.89	1
110	27.5	25.5	56.79	.45	2	89.1	61.49	64.4	62.4	110.90	.89	1
111	27.2	25.3	56.79	.44	2	89.1	61.94	64.6	62.6	111.89	.89	1
112	27.0	25.1	56.80	.44	2	89.1	62.39	64.8	62.8	112.88	.90	1
113	26.8	24.9	56.80	.44	2	89.1	62.84	65.0	63.0	113.88	.90	1
114	26.6	24.7	56.80	.43	2	89.1	63.29	65.1	63.2	114.87	.90	1

55 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
115	26.4	24.5	56.80	.43	2	89.1	63.74	65.3	63.4	115.86	.90	1
116	26.2	24.3	56.81	.43	2	89.1	64.19	65.5	63.6	116.86	.90	1
117	26.0	24.1	56.81	.42	2	89.1	64.64	65.7	63.8	117.85	.90	1
118	25.8	24.0	56.81	.42	2	89.1	65.09	65.9	64.0	118.85	.90	1
119	25.6	23.8	56.82	.42	2	89.1	65.55	66.1	64.2	119.85	.91	1
120	25.5	23.6	56.82	.41	2	89.1	66.00	66.3	64.4	120.83	.91	1
121	25.3	23.4	56.82	.41	2	89.1	66.46	66.4	64.6	121.83	.91	1
122	25.1	23.3	56.82	.41	2	89.1	66.91	66.6	64.8	122.82	.91	1
123	24.9	23.1	56.83	.41	2	89.1	67.37	66.8	65.0	123.82	.91	1
124	24.7	23.0	56.83	.40	2	89.2	67.82	66.9	65.1	124.81	.91	1
125	24.6	22.8	56.83	.40	2	89.2	68.28	67.1	65.3	125.81	.91	1
126	24.4	22.6	56.83	.40	2	89.2	68.74	67.3	65.5	126.80	.91	1
127	24.2	22.5	56.84	.40	2	89.2	69.20	67.4	65.7	127.80	.92	1
128	24.0	22.3	56.84	.39	2	89.2	69.66	67.6	65.8	128.79	.92	1
129	24.9	22.1	56.84	.39	2	89.2	70.12	67.7	66.0	129.79	.92	1
130	24.7	22.0	56.84	.39	2	89.2	70.58	67.9	66.2	130.78	.92	1
131	24.6	21.9	56.84	.38	2	89.2	71.04	68.0	66.3	131.77	.92	1
132	24.4	21.7	56.85	.38	2	89.2	71.50	68.2	66.5	132.77	.92	1

56 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
56	46.4	43.4	57.41	.70	2	88.5	39.60					
57	45.9	42.8	57.43	.70	2	88.6	39.95	46.9	43.9	58.40	.71	2
58	45.4	44.4	57.44	.69	2	88.6	40.31	47.4	44.4	59.39	.72	2
59	44.9	41.9	57.45	.69	2	88.6	40.67	47.9	44.9	60.38	.72	2
60	44.4	41.5	57.46	.68	2	88.6	41.09	48.3	45.4	61.36	73	2
61	43.9	41.0	57.47	67	2	88.6	41.40	48.8	45.9	62.35	.73	2
62	43.4	40.6	57.49	.67	2	88.6	41.77	49.2	46.3	63.34	.74	2
63	42.9	40.1	57.50	.66	2	88.6	42.15	49.7	46.9	64.33	.75	2
64	42.5	39.7	57.51	65	2	88.6	42.52	50.1	47.3	65.31	75	2
65	42.0	39.2	57.52	65	2	88.7	42.90	50.6	47.8	66.30	76	2
66	41.6	38.8	57.53	.64	2	88.7	43.28	51.0	48.2	67.29	.76	2
67	41.2	38.4	57.54	.64	2	88.7	43.66	51.4	48.6	68.28	77	2
68	40.7	38.0	57.54	.63	2	88.7	44.05	51.8	49.0	69.27	.77	2
69	40.3	37.6	57.55	.63	2	88.7	44.43	52.2	49.5	70.26	.77	2
70	39.9	37.2	57.56	.62	2	88.7	44.82	52.6	49.9	71.25	.78	2
71	39.5	36.8	57.57	.62	2	88.7	45.21	53.0	50.3	72.24	78	2
72	39.1	36.5	57.58	.61	2	88.7	45.61	53.3	50.7	73.23	.79	2
73	38.7	36.1	57.59	.61	2	88.8	46.00	53.7	51.1	74.22	.79	2
74	38.3	35.7	57.60	.60	2	88.8	46.40	54.1	51.5	75.21	.80	2
75	37.9	35.4	57.60	.60	2	88.8	46.80	54.5	51.9	76.20	.80	2
76	37.5	35.0	57.61	.59	2	88.8	47.20	54.8	52.2	77.18	.80	2
77	37.2	34.7	57.62	.58	2	88.8	47.60	55.1	52.6	78.17	.81	2
78	36.8	34.3	57.63	.58	2	88.8	48.01	55.5	53.0	79.17	.81	1
79	36.5	34.0	57.63	.58	2	88.8	48.42	55.8	53.3	80.16	.81	1
80	36.1	33.7	57.64	.57	2	88.8	48.83	56.1	53.7	81.15	.82	1
81	35.8	33.3	57.65	.57	2	88.8	49.24	56.5	54.0	82.14	.82	1
82	35.5	33.0	57.65	.56	2	88.8	49.65	56.8	54.3	83.13	.82	1
83	35.1	32.7	57.66	.56	2	88.9	50.06	57.1	54.7	84.12	.83	1
84	34.8	32.4	57.67	.55	2	88.9	50.48	57.4	55.0	85.11	.83	1
85	34.5	32.1	57.67	.55	2	88.9	50.89	57.7	55.3	86.10	.83	1

56 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
86	34.2	31.8	57.68	.54	2	88.9	51.31	58.0	55.6	87.09	.84	1
87	33.9	31.5	57.68	.54	2	88.9	51.73	58.3	56.0	88.08	.84	1
88	33.5	31.2	57.69	.53	2	88.9	52.15	58.6	56.3	89.07	.84	1
89	33.2	31.0	57.69	.53	2	88.9	52.59	58.9	56.6	90.07	.84	1
90	32.9	30.7	57.70	.53	2	88.9	53.00	59.2	56.9	91.06	.85	1
91	32.7	30.4	57.71	.52	2	88.9	53.42	59.4	57.2	92.05	.85	1
92	32.4	30.1	57.71	.52	2	88.9	53.85	59.7	57.5	93.04	.85	1
93	32.1	29.9	57.71	.51	2	88.9	54.28	60.0	57.8	94.03	.85	1
94	31.8	29.6	57.72	.51	2	88.9	54.71	60.3	58.0	95.02	.86	1
95	31.5	29.3	57.72	.51	2	89.0	55.14	60.5	58.3	96.02	.86	1
96	31.3	29.1	57.73	.50	2	89.0	55.57	60.8	58.6	97.01	.86	1
97	31.0	28.8	57.73	.50	2	89.0	56.00	61.0	58.8	98.00	.86	1
98	30.7	28.6	57.74	.49	2	89.0	56.43	61.3	59.1	98.99	.87	1
99	30.5	28.3	57.74	.49	2	89.0	56.87	61.5	59.3	99.99	.87	1
100	30.2	28.1	57.75	.49	2	89.0	57.31	61.7	59.6	100.98	.87	1
101	30.0	27.9	57.75	.48	2	89.0	57.74	62.0	59.9	101.97	.87	1
102	29.7	27.6	57.75	.48	2	89.0	58.18	62.2	60.1	102.96	.87	1
103	29.5	27.4	57.76	.48	2	89.0	58.62	62.5	60.4	103.96	.88	1
104	29.2	27.2	57.76	.47	2	89.0	59.06	62.7	60.6	104.95	.88	1
105	29.0	27.0	57.77	.47	2	89.0	59.50	62.9	60.9	105.94	.88	1
106	28.8	26.8	57.77	.46	2	89.0	59.94	63.1	61.1	106.93	.88	1
107	28.6	26.6	57.77	.46	2	89.0	60.38	63.3	61.3	107.93	.88	1
108	28.3	26.4	57.78	.46	2	89.1	60.83	63.5	61.5	108.92	.89	1
109	28.1	26.1	57.78	.45	2	89.1	61.27	63.7	61.7	109.91	.89	1
110	27.9	25.9	57.78	.45	2	89.1	61.72	63.9	62.0	110.91	.89	1
111	27.7	25.7	57.79	.45	2	89.1	62.16	64.1	62.2	111.90	.89	1
112	27.5	25.5	57.79	.45	2	89.1	62.61	64.3	62.4	112.90	.89	1
113	27.2	25.3	57.79	.44	2	89.1	63.06	64.5	62.6	113.89	.89	1
114	27.0	25.1	57.79	.44	2	89.1	63.50	64.7	62.8	114.88	.89	1
115	26.8	25.0	57.80	.44	2	89.1	63.95	64.9	63.0	115.88	.90	1

56 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
116	26.6	24 8	57.80	.43	2	89.1	64.40	65.1	63.2	116.87	.90	1
117	26.4	24.6	57.80	.43	2	89.1	6485	65 3	63.4	117.87	.90	1
118	26.2	24.4	57.81	43	2	89.1	65.31	65.5	63 6	118.86	.90	1
119	26 0	24.2	57.81	.42	2	89 1	65.76	65.7	63 8	119 85	.90	1
120	25.9	24 0	57 81	.42	2	89.1	66.21	65.8	64.0	120.85	.90	1
121	25.7	23.9	57 82	42	2	89 1	66.66	66.0	64.2	121.84	.91	1
122	25 5	23.7	57 82	.42	2	89.1	67 12	66.2	64.4	122 84	.91	1
123	25.3	23.5	57 82	.41	2	89.1	67.56	66.3	64 6	123.83	.91	1
124	25.1	23.3	57 82	.41	2	89.2	68 03	66 5	64.7	124.83	.91	1
125	25 0	23.2	57 83	.41	2	89 2	68 48	66.7	64 9	125.82	.91	1
126	24 8	23 0	57.83	.40	2	89.2	68 94	66 8	65.1	126.81	.91	1
127	24 6	22.9	57 83	.40	2	89.2	69.40	67 0	65 3	127 81	91	1
128	24 4	22.7	57 83	.40	2	89 2	69 86	67.2	65.4	128 80	.91	1
129	24 2	22.5	57 84	.40	2	89.2	70 32	67 3	65 6	129 80	.92	1
130	24.1	22.4	57.84	.39	2	89 2	70.78	67.5	65.8	130.79	.92	1
131	23 9	22.2	57 84	.39	2	89 2	71.23	67 6	65.9	131.79	.92	1
132	23.8	22.1	57 84	.39	2	89.2	71 69	67.8	66.1	132.78	.92	1

57 TEETH INTO.	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
57	46.4	43.4	58.41	.70	2	88.6	40.30					
58	45.9	42.9	58.43	.70	2	88.6	40.66	46.9	43.9	59.40	.71	2
59	45.4	42.4	58.44	.69	2	88.6	41.02	47.4	44.4	60.39	.72	2
60	44.9	42.0	58.45	.69	2	88.6	41.38	47.8	44.9	61.38	.72	2
61	44.4	41.5	58.46	.68	2	88.6	41.74	48.3	45.4	62.36	.73	2
62	43.9	41.0	58.47	.67	2	88.6	42.11	48.7	45.9	63.35	.73	2
63	43.4	40.6	58.48	.67	2	88.6	42.48	49.2	46.3	64.34	.74	2
64	43.0	40.2	58.49	.66	2	88.7	42.85	49.6	46.8	65.33	.74	2
65	42.5	39.8	58.50	.66	2	88.7	43.23	50.0	47.3	66.32	.75	2
66	42.1	39.3	58.51	.65	2	88.7	43.60	50.5	47.7	67.31	.75	2
67	41.7	38.9	58.52	.64	2	88.7	43.98	50.9	48.1	68.29	.76	2
68	41.2	38.5	58.53	.64	2	88.7	44.37	51.3	48.6	69.28	.76	2
69	40.8	38.1	58.54	.63	2	88.7	44.75	51.7	49.0	70.27	.77	2
70	40.4	37.7	58.55	.63	2	88.7	45.13	52.1	49.4	71.26	.77	2
71	40.0	37.3	58.56	.62	2	88.7	45.52	52.5	49.8	72.25	.78	2
72	39.6	37.0	58.57	.62	2	88.7	45.92	52.9	50.2	73.24	.78	2
73	39.2	36.6	58.58	.61	2	88.8	46.31	53.2	50.6	74.23	.79	2
74	38.8	36.2	58.59	.61	2	88.8	46.70	53.6	51.0	75.22	.79	2
75	38.4	35.9	58.59	.60	2	88.8	47.10	54.0	51.4	76.21	.79	2
76	38.0	35.5	58.60	.60	2	88.8	47.50	54.3	51.8	77.20	.80	2
77	37.7	35.2	58.61	.59	2	88.8	47.90	54.7	52.1	78.19	.80	2
78	37.3	34.9	58.62	.59	2	88.8	48.30	55.0	52.5	79.18	.81	2
79	37.0	34.5	58.62	.58	2	88.8	48.70	55.3	52.9	80.17	.81	1
80	36.6	34.2	58.63	.58	2	88.8	49.11	55.7	53.2	81.16	.81	1
81	36.3	33.8	58.64	.57	2	88.8	49.52	56.0	53.6	82.15	.82	1
82	35.9	33.5	58.64	.57	2	88.8	49.93	56.3	53.9	83.14	.82	1
83	35.6	33.2	58.65	.56	2	88.9	50.34	56.6	54.2	84.13	.82	1
84	35.3	32.9	58.66	.56	2	88.9	50.76	56.9	54.6	85.12	.83	1
85	35.0	32.6	58.66	.55	2	88.9	51.17	57.3	54.9	86.11	.83	1
86	34.6	32.3	58.67	.55	2	88.9	51.59	57.5	55.2	87.10	.83	1

	PINION					PINION AND GEAR		GEAR				
57 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
87	34.3	32.0	58.67	.55	2	88.9	52.00	57.9	55.5	88.10	.83	1
88	34.0	31.7	58.68	.54	2	88.9	52.42	58.1	55.8	89.09	.84	1
89	33.7	31.4	58.69	54	2	88.9	52.84	58.4	56.1	90.08	.84	1
90	33.4	31.2	58.69	.53	2	88.9	53.27	58.7	56.4	91.07	.84	1
91	33.1	30.9	58.70	.53	2	88.9	53.69	59.0	56.7	92.06	.85	1
92	32.8	30.6	58.70	.52	2	88.9	54.11	59.3	57.0	93.05	.85	1
93	32.5	30.3	58.71	.52	2	88.9	54.54	59.6	57.3	94.05	.85	1
94	32.2	30.1	58.71	.52	2	89.0	54.96	59.8	57.6	95.04	.85	1
95	32.0	29.8	58.72	.51	2	89.0	55.39	60.1	57.9	96.03	.86	1
96	31.7	29.5	58.72	.51	2	89.0	55.82	60.3	58.1	97.02	.86	1
97	31.5	29.3	58.73	.50	2	89.0	56.25	60.6	58.4	98.01	.86	1
98	31.2	29.0	58.73	.50	2	89.0	56.68	60.8	58.7	99.01	.86	1
99	30.9	28.8	58.73	.50	2	89.0	57.12	61.1	58.9	100.00	.86	1
100	30.7	28.5	58.74	.49	2	89.0	57.55	61.3	59.2	100.99	.87	1
101	30.4	28.3	58.74	.49	2	89.0	57.99	61.5	59.4	101.99	.87	1
102	30.1	28.1	58.75	.49	2	89.0	58.42	61.8	59.7	102.98	.87	1
103	29.9	27.9	58.75	.48	2	89.0	58.86	62.0	60.0	103.97	.87	1
104	29.7	27.6	58.75	.48	2	89.0	59.30	62.2	60.2	104.96	.87	1
105	29.4	27.4	58.76	.47	2	89.0	59.74	62.5	60.5	105.95	.88	1
106	29.2	27.2	58.76	.47	2	89.0	60.18	62.7	60.7	106.95	.88	1
107	29.0	27.0	58.77	.47	2	89.1	60.62	62.9	60.9	107.94	.88	1
108	28.7	26.8	58.77	.46	2	89.1	61.06	63.1	61.1	108.93	.88	1
109	28.5	26.6	58.77	.46	2	89.1	61.50	63.3	61.3	109.93	.88	1
110	28.3	26.3	58.78	.46	2	89.1	61.95	63.5	61.6	110.92	.89	1
111	28.1	26.1	58.78	.45	2	89.1	62.39	63.7	61.8	111.91	.89	1
112	27.9	25.9	58.78	.45	2	89.1	62.84	63.9	62.0	112.91	.89	1
113	27.6	25.8	58.79	.45	2	89.1	63.28	64.1	62.2	113.90	.89	1
114	27.4	25.6	58.79	.45	2	89.1	63.73	64.3	62.4	114.90	.89	1
115	27.2	25.4	58.79	.44	2	89.1	64.17	64.5	62.6	115.89	.89	1
116	27.0	25.2	58.79	.44	2	89.1	64.62	64.7	62.8	116.88	.89	1

57 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
117	26.8	25.0	58.80	.44	2	89.1	65.07	64.9	63.0	117.88	.90	1
118	26.6	24.8	58.80	.43	2	89.1	65.52	65.1	63.2	118.87	90	1
119	26.4	24.6	58.80	43	2	89.1	65.97	65.3	63.4	119.87	90	1
120	26.2	24.4	58.81	.43	2	89.1	66.42	65.5	63.6	120.86	.90	1
121	26.1	24.3	58.81	.42	2	89.1	66.88	65.6	63.8	121.85	.90	1
122	25.9	24.1	58.81	.42	2	89.1	67.33	65.8	64.0	122.85	.90	1
123	25.7	23.9	58.82	.42	2	89.2	67.78	66.0	64.2	123.84	.91	1
124	25.5	23.7	58.82	.42	2	89.2	68.24	66.1	64.4	124.84	91	1
125	25.3	23.6	58.82	.41	2	89.2	68.69	66.3	64.5	125.83	.91	1
126	25.2	23.4	58.82	.41	2	89.2	69.14	66.5	64.7	126.83	.91	1
127	25.0	23.2	58.83	.41	2	89.2	69.60	66.7	64.9	127.82	91	1
128	24.8	23.1	58.83	41	2	89.2	70.06	66.8	65.1	128.82	91	1
129	24.6	22.9	58.83	.40	2	89.2	70.52	67.0	65.2	129.81	91	1
130	24.5	22.8	58.83	.40	2	89.2	70.97	67.1	65.4	130.81	91	1
131	24.3	22.6	58.83	.40	2	89.2	71.43	67.3	65.6	131.80	.91	1
132	24.1	22.5	58.84	.39	2	89.2	71.89	67.4	65.8	132.79	.92	1

58 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
58	46.3	43.4	59.41	.70	2	88.6	41.01					
59	45.8	42.9	59.43	.70	2	88.6	41.37	46.9	43.9	60.40	.71	2
60	45.4	42.5	59.44	.69	2	88.6	41.73	47.3	44.4	61.39	.72	2
61	44.9	42.0	59.45	.69	2	88.6	42.09	47.8	44.9	62.38	.72	2
62	44.4	41.6	59.46	.68	2	88.6	42.45	48.2	45.4	63.36	.73	2
63	43.9	41.1	59.47	.67	2	88.7	42.82	48.7	45.9	64.35	.73	2
64	43.5	40.7	59.48	.67	2	88.7	43.19	49.1	46.3	65.34	.74	2
65	43.0	40.3	59.49	.66	2	88.7	43.56	49.5	46.8	66.33	.74	2
66	42.6	39.8	59.50	.66	2	88.7	43.93	50.0	47.2	67.32	.75	2
67	42.1	39.4	59.51	.65	2	88.7	44.31	50.4	47.7	68.31	.75	2
68	41.7	39.0	59.52	.65	2	88.7	44.69	50.8	48.1	69.30	.76	2
69	41.3	38.6	59.53	.64	2	88.7	45.07	51.2	48.5	70.28	.76	2
70	40.9	38.2	59.54	.63	2	88.7	45.45	51.6	48.9	71.27	.77	2
71	40.5	37.8	59.55	.63	2	88.7	45.84	52.0	49.4	72.26	.77	2
72	40.1	37.5	59.56	.62	2	88.8	46.23	52.4	49.8	73.25	.78	2
73	39.7	37.1	59.57	.62	2	88.8	46.62	52.7	50.1	74.24	.78	2
74	39.3	36.7	59.57	.61	2	88.8	47.01	53.1	50.6	75.23	.78	2
75	38.9	36.4	59.58	.61	2	88.8	47.40	53.5	50.9	76.22	.79	2
76	38.5	36.0	59.59	.60	2	88.8	47.80	53.8	51.3	77.21	.79	2
77	38.1	35.6	59.60	.60	2	88.8	48.20	54.2	51.7	78.20	.80	2
78	37.8	35.3	59.61	.59	2	88.8	48.60	54.5	52.0	79.19	.80	2
79	37.4	35.0	59.61	.59	2	88.8	49.00	54.9	52.4	80.18	.80	1
80	37.0	34.6	59.62	.58	2	88.8	49.41	55.2	52.8	81.17	.81	1
81	36.7	34.3	59.63	.58	2	88.8	49.81	55.5	53.1	82.16	.81	1
82	36.4	34.0	59.64	.57	2	88.9	50.22	55.9	53.5	83.15	.82	1
83	36.0	33.7	59.64	.57	2	88.9	50.63	56.2	53.8	84.14	.82	1
84	35.7	33.4	59.65	.57	2	88.9	51.04	56.5	54.1	85.14	.82	1
85	35.4	33.0	59.65	.56	2	88.9	51.45	56.8	54.5	86.13	.82	1
86	35.1	32.7	59.66	.56	2	88.9	51.86	57.1	54.8	87.12	.83	1
87	34.8	32.4	59.67	.55	2	88.9	52.28	57.4	55.1	88.11	.83	1

	PINION					PINION AND GEAR		GEAR				
58 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
88	34.5	32.2	59.67	.55	2	88.9	52.70	57.7	55.4	89.10	.83	1
89	34.1	31.9	59.68	.54	2	88.9	53.11	58.0	55.7	90.09	.84	1
90	33.8	31.6	59.68	.54	2	88.9	53.53	58.3	56.0	91.08	.84	1
91	33.5	31.3	59.69	.53	2	88.9	53.95	58.5	56.3	92.07	.84	1
92	33.3	31.0	59.69	.53	2	88.9	54.38	58.8	56.6	93.07	.84	1
93	33.0	30.8	59.70	.53	2	89.0	54.80	59.1	56.9	94.06	.85	1
94	32.7	30.5	59.70	.52	2	89.0	55.23	59.4	57.2	95.05	.85	1
95	32.4	30.2	59.71	.52	2	89.0	55.65	59.6	57.4	96.04	.85	1
96	32.1	30.0	59.71	.52	2	89.0	56.08	59.9	57.7	97.04	.85	1
97	31.8	29.7	59.72	.51	2	89.0	56.51	60.1	58.0	98.03	.86	1
98	31.6	29.5	59.72	.51	2	89.0	56.94	60.4	58.3	99.02	.86	1
99	31.3	29.2	59.73	.50	2	89.0	57.37	60.6	58.5	100.01	.86	1
100	31.1	29.0	59.73	.50	2	89.0	57.80	60.9	58.8	101.01	.86	1
101	30.8	28.7	59.74	.50	2	89.0	58.23	61.1	59.0	102.00	.87	1
102	30.6	28.5	59.74	.49	2	89.0	58.67	61.4	59.3	102.99	.87	1
103	30.3	28.3	59.74	.49	2	89.0	59.10	61.6	59.5	103.98	.87	1
104	30.1	28.0	59.75	.49	2	89.0	59.54	61.8	59.8	104.98	.87	1
105	29.8	27.8	59.75	.48	2	89.0	59.98	62.0	60.0	105.97	.87	1
106	29.6	27.6	59.76	.48	2	89.0	60.42	62.3	60.3	106.96	.88	1
107	29.4	27.4	59.76	.47	2	89.1	60.85	62.5	60.5	107.95	.88	1
108	29.1	27.2	59.76	.47	2	89.1	61.29	62.7	60.7	108.95	.88	1
109	28.9	27.0	59.77	.47	2	89.1	61.73	62.9	60.9	109.94	.88	1
110	28.7	26.8	59.77	.46	2	89.1	62.18	63.1	61.2	110.93	.88	1
111	28.5	26.5	59.77	.46	2	89.1	62.62	63.3	61.4	111.93	.88	1
112	28.3	26.3	59.78	.46	2	89.1	63.06	63.5	61.6	112.92	.89	1
113	28.0	26.1	59.78	.45	2	89.1	63.51	63.7	61.8	113.91	.89	1
114	27.8	25.9	59.78	.45	2	89.1	63.95	63.9	62.0	114.91	.89	1
115	27.6	25.8	59.79	.45	2	89.1	64.40	64.1	62.2	115.90	.89	1
116	27.4	25.6	59.79	.45	2	89.1	64.85	64.3	62.5	116.90	.89	1
117	27.2	25.4	59.79	.44	2	89.1	65.29	64.5	62.7	117.89	.89	1

	PINION					PINION AND GEAR		GEAR				
58 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
118	27.0	25.2	59.79	.44	2	89.1	65.74	64.7	62.9	118.88	.89	1
119	26.8	25.0	59.80	.44	2	89.1	66.19	64.9	63.1	119.88	.90	1
120	26.6	24.8	59.80	.43	2	89.1	66.64	65.1	63.2	120.87	.90	1
121	26.4	24.6	59.80	.43	2	89.1	67.09	65.3	63.4	121.87	.90	1
122	26.2	24.5	59.81	.43	2	89.1	67.54	65.4	63.6	122.86	.90	1
123	26.1	24.3	59.81	.42	2	89.2	68.00	65.6	63.8	123.85	.90	1
124	25.9	24.1	59.81	.42	2	89.2	68.45	65.8	64.0	124.85	.90	1
125	25.7	23.9	59.82	.42	2	89.2	68.90	66.0	64.2	125.84	.91	1
126	25.5	23.8	59.82	.42	2	89.2	69.35	66.1	64.4	126.84	.91	1
127	25.3	23.6	59.82	.41	2	89.2	69.81	66.3	64.5	127.83	.91	1
128	25.2	23.4	59.82	.41	2	89.2	70.26	66.5	64.7	128.83	.91	1
129	25.0	23.3	59.83	.41	2	89.2	70.72	66.6	64.9	129.82	.91	1
130	24.8	23.1	59.83	.41	2	89.2	71.18	66.6	65.0	130.82	.91	1
131	24.7	23.0	59.83	.40	2	89.2	71.63	66.9	65.2	131.81	.91	1
132	24.5	22.8	59.83	.40	2	89.2	72.09	67.1	65.4	132.81	.91	1

59 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
59	46.3	43.4	60.41	.70	2	88.6	41.72					
60	45.9	43.0	60.43	.70	2	88.6	42.07	46.8	43.9	61.40	.71	2
61	45.4	42.5	60.44	.69	2	88.6	42.43	47.3	44.4	62.39	.72	2
62	44.9	42.0	60 45	.69	2	88.7	42.79	47.8	44.9	63.38	.72	2
63	44.4	41.6	60.46	.68	2	88.7	43.16	48.2	45.4	64.37	.73	2
64	44.0	41.2	60.47	.67	2	88.7	43.52	48.6	45.9	65.35	.73	2
65	43.5	40.7	60.48	.67	2	88.7	43.89	49.1	46.3	66.34	.74	2
66	43.1	40.3	60.49	.66	2	88.7	44.26	49.5	46.7	67.33	.74	2
67	42.6	39.9	60.50	.66	2	88.7	44.64	49.9	47.2	68.32	.75	2
68	42 2	39.5	60.51	.65	2	88.7	45.01	50.3	47.6	69.31	.75	2
69	41.8	39.1	60.52	.65	2	88.7	45.39	50.7	48.0	70.30	.76	2
70	41.4	38.7	60.53	.64	2	88.7	45.77	51.1	48.4	71.29	.76	2
71	41.0	38.3	60.54	.64	2	88.8	46.16	51.5	48.8	72.28	.77	2
72	40.6	37.9	60.55	.63	2	88.8	46.54	51.9	49.3	73.27	.77	2
73	40.1	37.5	60.56	.63	2	88.8	46.93	52.3	49.7	74.26	.78	2
74	39.7	37.2	60.56	.62	2	88.8	47.32	52.6	50.1	75.25	.78	2
75	39.3	36.8	60.57	61	2	88.8	47.71	53.0	50.5	76.23	.78	2
76	39.0	36.4	60.58	.61	2	88.8	48.11	53.4	50.9	77.22	.79	2
77	38.6	36.1	60.59	.60	2	88.8	48.50	53.7	51.2	78.21	.79	2
78	38.2	35.8	60.60	60	2	88.8	48.90	54.0	51.6	79.20	.80	2
79	37.9	35.4	60.60	.60	2	88.8	49.30	54.4	51.9	80.20	80	2
80	37.5	35.1	60.61	.59	2	88.8	49.70	54.7	52 3	81.19	.80	1
81	37.2	34.8	60.62	.59	2	88.9	50.10	55.0	52.6	82.18	.81	1
82	36.9	34.5	60.63	.58	2	88.9	50.51	55.3	53.0	83.17	81	1
83	36.5	34.1	60.63	58	2	88.9	50.92	55.7	53.3	84.16	.81	1
84	36.2	33.8	60.64	.57	2	88.9	51.32	56.0	53.7	85.15	.82	1
85	35.8	33.5	60.65	.57	2	88.9	51.73	56.3	54.0	86.14	.82	1
86	35.5	33.2	60 65	.56	2	88.9	52.15	56.6	54.3	87.13	.82	1
87	35.2	32.9	60.66	.56	2	88.9	52.56	56.9	54.6	88.12	.83	1
88	34.9	32.6	60.66	.55	2	88.9	52.97	57.2	54.9	89.11	.83	1

59 TEETH INTO	PINION FACE ANGLE	PINION CUTTING ANGLE	PINION OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	PINION BACKING FOR 1 PITCH. DIVIDE BY PITCH	PINION NO OF CUTTER TO USE	PINION AND GEAR BACK ANGLE	PINION AND GEAR PITCH CONE RADIUS DIVIDE BY PITCH	GEAR FACE ANGLE	GEAR CUTTING ANGLE	GEAR OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	GEAR BACKING FOR 1 PITCH DIVIDE BY PITCH	GEAR NO OF CUTTER TO USE
89	34.6	32.3	60.67	.55	2	88.9	53.39	57.5	55.2	90.10	.83	1
90	34.3	32.0	60.67	.55	2	88.9	53.81	57.8	55.5	91.10	.83	1
91	34.0	31.8	60.68	.54	2	88.9	54.22	58.1	55.9	92.09	.84	1
92	33.7	31.5	60.69	.54	2	88.9	54.65	58.4	56.2	93.08	.84	1
93	33.4	31.2	60.69	.53	2	89.0	55.07	58.6	56.5	94.07	.84	1
94	33.1	31.0	60.70	.53	2	89.0	55.49	58.9	56.7	95.06	85	1
95	32.8	30.7	60.70	.53	2	89.0	55.91	59.2	57.0	96.06	85	1
96	32.6	30.4	60.71	.52	2	89.0	56.34	59.4	57.3	97.05	.85	1
97	32.3	30.2	60.71	.52	2	89.0	56.77	59.7	57.6	98.04	.85	1
98	32.0	29.9	60.71	.51	2	89.0	57.19	60.0	57.8	99.03	.85	1
99	31.8	29.7	60.72	.51	2	89.0	57.62	60.2	58.1	100.02	.86	1
100	31.5	29.4	60.72	.51	2	89.0	58.05	60.4	58.4	101.02	.86	1
101	31.2	29.2	60.73	.50	2	89.0	58.48	60.7	58.6	102.01	86	1
102	31.0	28.9	60.73	.50	2	89.0	58.92	60.9	58.9	103.00	.86	1
103	30.7	28.7	60.74	.50	2	89.0	59.35	61.2	59.1	104.00	87	1
104	30.5	28.5	60.74	.49	2	89.0	59.78	61.4	59.4	104.99	.87	1
105	30.2	28.3	60.74	.49	2	89.0	60.22	61.6	59.6	105.98	.87	1
106	30.0	28.0	60.75	.48	2	89.1	60.66	61.9	59.8	106.97	87	1
107	29.8	27.8	60.75	.48	2	89.1	61.09	62.1	60.1	107.97	.87	1
108	29.6	27.6	60.76	.48	2	89.1	61.53	62.3	60.3	108.96	.88	1
109	29.3	27.4	60.76	.47	2	89.1	61.97	62.5	60.5	109.95	.88	1
110	29.1	27.2	60.76	.47	2	89.1	62.41	62.7	60.8	110.95	.88	1
111	28.9	27.0	60.77	.47	2	89.1	62.85	62.9	61.0	111.94	.88	1
112	28.7	26.8	60.77	.46	2	89.1	63.29	63.1	61.2	112.93	.88	1
113	28.4	26.5	60.77	.46	2	89.1	63.74	63.3	61.4	113.93	.88	1
114	28.2	26.3	60.78	.46	2	89.1	64.18	63.5	61.6	114.92	.89	1
115	28.0	26.2	60.78	.45	2	89.1	64.63	63.7	61.8	115.91	.89	1
116	27.8	26.0	60.78	.45	2	89.1	65.07	63.9	62.0	116.91	.89	1
117	27.6	25.8	60.79	.45	2	89.1	65.52	64.1	62.3	117.90	.89	1
118	27.4	25.6	60.79	.45	2	89.1	65.96	64.3	62.5	118.90	.89	1

59 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
119	27.2	25.4	60.79	.44	2	89.1	66.41	64.5	62.7	119.89	.89	1
120	27.0	25.2	60.79	.44	2	89.1	66.86	64.7	62.9	120.88	.89	1
121	26.8	25.0	60.80	.44	2	89.1	67.31	64.9	63.1	121.88	.90	1
122	26.6	24.8	60.80	.43	2	89.2	67.76	65.0	63.2	122.87	.90	1
123	26.4	24.7	60.80	.43	2	89.2	68.21	65.2	63.4	123.87	.90	1
124	26.3	24.5	60.81	.43	2	89.2	68.66	65.4	63.6	12486	.90	1
125	26.1	24.3	60.81	.42	2	89.2	69.11	65.6	63.8	125.85	.90	1
126	25.9	24.1	60.81	.42	2	89.2	69.56	65.7	64.0	126.85	.90	1
127	25.7	24.0	60.81	.42	2	89.2	70.02	65.9	64.2	127.84	.90	1
128	25.5	23.8	60.82	.42	2	89.2	70.47	66.1	64.3	128.84	.91	1
129	25.4	23.7	60.82	.41	2	89.2	70.92	66.2	64.5	129.83	.91	1
130	25.2	23.5	60.82	.41	2	89.2	71.38	66.4	64.7	130.83	.91	1
131	25.0	23.3	60.82	.41	2	89.2	71.84	66.6	64.9	131.82	.91	1
132	24.8	23.2	60.83	.41	2	89.2	72.29	66.7	65.0	132.82	.91	1

60 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO OF CUTTER TO USE
60	46 3	43 5	61 41	70	2	88 6	42 48					
61	45 8	43 0	61 43	70	2	88 7	42 78	46 8	44 0	62 40	.71	2
62	45 4	42 5	61 44	69	2	88 7	43.14	47 3	44 4	63 39	72	2
63	44.9	42 1	61 45	69	2	88 7	43.50	47 7	44 9	64 38	72	2
64	44 4	41 7	61 46	68	2	88 7	43.86	48 1	45 4	65 37	73	2
65	43 9	41 2	61 47	67	2	88 7	44.23	48 6	45 9	66 35	73	2
66	43 5	40 8	61 48	67	2	88.7	44.60	49 0	46 3	67.34	74	2
67	43 1	40 4	61.49	66	2	88 7	44.97	49 4	46 7	68 33	74	2
68	42.7	40 0	61 50	66	2	88 7	45.34	49 8	47 2	69 32	.75	2
69	42 2	39 6	61 51	65	2	88 7	45.72	50.2	47.6	70 31	.75	2
70	41 8	39.2	61 52	65	2	88.8	46.10	50 6	48 0	71.30	76	2
71	41.4	38.8	61.53	64	2	88 8	46.48	51.0	48 4	72 29	76	2
72	41.0	38 4	61.54	64	2	88 8	46.86	51.4	48 8	73.28	77	2
73	40 6	38 0	61.55	.63	2	88.8	47.25	51.8	49 2	74.27	.77	2
74	40.2	37.7	61.55	.63	2	88 8	47.63	52.1	49 6	75.26	77	2
75	39 8	37.3	61.56	.62	2	88 8	48.02	52 5	50 0	76 25	78	2
76	39 4	36 9	61 57	62	2	88.8	48.41	52.9	50.4	77.24	.78	2
77	39.1	36.6	61 58	.61	2	88.8	48.81	53 2	50 8	78 23	79	2
78	38.7	36.2	61 59	61	2	88.8	49.20	53.6	51.1	79.22	79	2
79	38.3	35.9	61.59	.60	2	88.8	49.60	53.9	51.5	80.21	79	2
80	38.0	35.6	61 60	.60	2	88.9	50 00	54.3	51.9	81.20	.80	2
81	37.6	35.2	61.61	59	2	88.9	50.40	54.6	52 2	82.19	.80	1
82	37.3	34.9	61.62	.59	2	88.9	50.80	54.9	52 5	83.18	.81	1
83	36.9	34.6	61.62	.58	2	88.9	51.21	55.2	52.9	84.17	.81	1
84	36.6	34.3	61.63	.58	2	88.9	51.61	55.5	53.2	85.16	.81	1
85	36.3	34.0	61.64	.57	2	88.9	52.02	55.9	53.6	86.15	.82	1
86	36.0	33.7	61.64	.57	2	88.9	52.43	56.2	53.9	87.14	.82	1
87	35.6	33.4	61.65	.56	2	88.9	52.84	56.5	54.2	88.13	.82	1
88	35.3	33.1	61.65	.56	2	88.9	53.25	56.8	54.5	89.13	.82	1
89	35.0	32.8	61.66	.56	2	88.9	53.67	57.1	54.8	90.12	.83	1

	PINION					PINION AND GEAR		GEAR				
60 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH DIVIDE BY PITCH	BACKING FOR 1 PITCH DIVIDE BY PITCH	NO OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
90	34.7	32.5	61.67	.55	2	88.9	54.08	57.4	55.1	91.11	.83	1
91	34.4	32.2	61.67	55	2	88.9	54.50	57.6	55.4	92.10	83	1
92	34.1	31.9	61.68	.54	2	89.0	54.92	57.9	55.7	93.09	84	1
93	33.8	31.7	61.68	54	2	89.0	55.34	58.2	56.0	94.08	.84	1
94	33.5	31.4	61.69	54	2	89.0	55.76	58.5	56.3	95.08	84	1
95	33.3	31.1	61.69	.53	2	89.0	56.18	58.7	56.6	96.07	.84	1
96	33.0	30.9	61.70	53	2	89.0	56.60	59.0	56.9	97.06	.85	1
97	32.7	30.6	61.70	52	2	89.0	57.03	59.3	57.1	98.05	85	1
98	32.4	30.3	61.71	52	2	89.0	57.45	59.5	57.4	99.05	.85	1
99	32.2	30.1	61.71	.52	2	89.0	57.88	59.8	57.7	100.04	.85	1
100	31.9	29.8	61.72	51	2	89.0	58.31	60.0	58.0	101.03	.86	1
101	31.6	29.6	61.72	51	2	89.0	58.74	60.3	58.2	102.02	.86	1
102	31.4	29.3	61.72	51	2	89.0	59.17	60.5	58.5	103.02	.86	1
103	31.1	29.1	61.73	.50	2	89.0	59.60	60.7	58.7	104.01	.86	1
104	30.9	28.9	61.73	.50	2	89.0	60.03	61.0	59.0	105.00	.86	1
105	30.6	28.7	61.74	.49	2	89.0	60.47	61.2	59.2	105.99	.87	1
106	30.4	28.4	61.74	49	2	89.1	60.90	61.4	59.4	106.99	.87	1
107	30.2	28.2	61.75	.49	2	89.1	61.34	61.7	59.7	107.98	.87	1
108	29.9	28.0	61.75	.48	2	89.1	61.77	61.9	59.9	108.97	.87	1
109	29.7	27.8	61.75	.48	2	89.1	62.21	62.1	60.1	109.97	.87	1
110	29.5	27.6	61.76	.48	2	89.1	62.65	62.3	60.4	110.96	.88	1
111	29.2	27.3	61.76	.47	2	89.1	63.09	62.5	60.6	111.95	.88	1
112	29.0	27.1	61.76	.47	2	89.1	63.53	62.7	60.8	112.95	.88	1
113	28.8	26.9	61.77	.47	2	89.1	63.97	62.9	61.0	113.94	.88	1
114	28.6	26.7	61.77	.46	2	89.1	64.41	63.1	61.2	114.93	.88	1
115	24.4	26.5	61.77	.46	2	89.1	64.86	63.3	61.5	115.93	.88	1
116	28.2	26.3	61.78	.46	2	89.1	65.30	63.5	61.7	116.92	.89	1
117	28.0	26.1	61.78	.45	2	89.1	65.74	63.7	61.9	117.91	.89	1
118	27.8	26.0	61.78	.45	2	89.1	66.19	63.9	62.1	118.91	.89	1
119	27.6	25.8	61.79	.45	2	89.1	66.64	64.1	62.3	119.90	.89	1

PINION						PINION AND GEAR		GEAR				
60 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
120	27.4	25.6	61.79	.45	2	89.1	67.08	64.3	62.5	120.90	.89	1
121	27.2	25.4	61.79	.44	2	89.1	67.53	64.5	62.7	121.89	.89	1
122	27.0	25.2	61.79	.44	2	89.2	67.93	64.7	62.9	122.88	.89	1
123	26.8	25.0	61.80	.44	2	89.2	68.43	64.9	63.1	123.88	.90	1
124	26.6	24.9	61.80	.43	2	89.2	68.88	65.0	63.3	124.87	.90	1
125	26.4	24.7	61.80	.43	2	89.2	69.33	65.2	63.5	125.87	.90	1
126	26.2	24.5	61.81	.43	2	89.2	69.78	65.4	63.6	126.86	.90	1
127	26.1	24.3	61.81	.43	2	89.2	70.23	65.5	63.8	127.86	.90	1
128	25.9	24.2	61.81	.42	2	89.2	70.68	65.7	64.0	128.85	.90	1
129	25.7	24.0	61.81	.42	2	89.2	71.14	65.9	64.2	129.84	.90	1
130	25.5	23.8	61.82	.42	2	89.2	71.59	66.0	64.3	130.84	.91	1
131	25.4	23.7	61.82	.41	2	89.2	72.04	66.2	64.5	131.83	.91	1
132	25.2	23.5	61.82	.41	2	89.2	72.50	66.4	64.7	132.83	.91	1

	PINION					PINION AND GEAR		GEAR				
61 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
61	46.3	43.5	62.41	.70	2	88.7	43.13					
62	45.8	43.0	62.43	.70	2	88.7	43.39	46.8	44.0	63.40	.71	2
63	45.3	42.6	62.44	.69	2	88.7	43.85	47.2	44.5	64.39	.72	2
64	44.9	42.2	62.45	.69	2	88.7	44.21	47.7	44.9	65.38	.72	2
65	44.4	41.7	62.46	.68	2	88.7	44.57	48.1	45.4	66.37	.73	2
66	44.0	41.3	62.47	.68	2	88.7	44.93	48.5	45.8	67.36	.73	2
67	43.5	40.9	62.48	.67	2	88.7	45.30	48.9	46.3	68.35	.73	2
68	43.1	40.5	62.49	.66	2	88.7	45.67	49.3	46.7	69.33	.74	2
69	42.7	40.1	62.50	.66	2	88.8	46.05	49.8	47.1	70.32	.74	2
70	42.3	39.7	62.51	.65	2	88.8	46.42	50.1	47.6	71.31	.75	2
71	41.9	39.3	62.52	.65	2	88.8	46.80	50.6	48.0	72.30	.76	2
72	41.5	38.9	62.53	.64	2	88.8	47.18	50.9	48.4	73.29	76	2
73	41.1	38.5	62.54	.64	2	88.8	47.56	51.3	48.8	74.28	.77	2
74	40.7	38.1	62.54	.63	2	88.8	47.95	51.7	49.2	75.27	.77	2
75	40.3	37.8	62.55	.63	2	88.8	48.34	52.0	49.5	76.26	.77	2
76	39.9	37.4	62.56	.62	2	88.8	48.73	52.4	49.9	77.25	.78	2
77	39.5	37.0	62.57	.62	2	88.8	49.12	52.8	50.3	78.24	.78	2
78	39.1	36.7	62.58	.61	2	88.8	49.51	53.1	50.7	79.23	.79	2
79	38.8	36.4	62.58	.61	2	88.8	49.90	53.5	51.0	80.22	.79	2
80	38.4	36.0	62.59	.60	2	88.9	50.30	53.8	51.4	81.21	.79	2
81	38.1	35.7	62.60	.60	2	88.9	50.70	54.1	51.8	82.20	.80	1
82	37.7	35.4	62.61	.59	2	88.9	51.10	54.5	52.1	83.19	.80	1
83	37.4	35.0	62.61	.59	2	88.9	51.50	54.8	52.5	84.18	.80	1
84	37.0	34.7	62.62	.58	2	88.9	51.90	55.1	52.8	85.17	.81	1
85	36.7	34.4	62.63	.58	2	88.9	52.31	55.4	53.1	86.17	81	1
86	36.4	34.1	62.63	.58	2	88.9	52.72	55.7	53.4	87.16	.81	1
87	36.1	33.8	62.64	.57	2	88.9	53.13	56.0	53.7	88.15	.82	1
88	35.8	33.5	62.65	.57	2	88.9	53.54	56.3	54.1	89.14	.82	1
89	35.4	33.2	62.65	.56	2	88.9	53.95	56.6	54.4	90.13	.82	1
90	35.1	32.9	62.66	.56	2	88.9	54.36	56.9	54.7	91.12	.83	1

	PINION					PINION AND GEAR		GEAR				
61 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
91	34.8	32.6	62.66	.55	2	89.0	54.77	57.2	55.0	92.11	.83	1
92	34.5	32.4	62.67	.55	2	89.0	55.19	57.5	55.3	93.10	.83	1
93	34.2	32.1	62.67	.55	2	89.0	55.61	57.8	55.6	94.10	.83	1
94	34.0	31.8	62.68	.54	2	89.0	56.03	58.0	55.9	95.09	.84	1
95	33.7	31.5	62.68	.54	2	89.0	56.45	58.3	56.2	96.08	.84	1
96	33.4	31.3	62.69	.53	2	89.0	56.87	58.6	56.5	97.07	.84	1
97	33.1	31.0	62.69	.53	2	89.0	57.29	58.8	56.7	98.07	.84	1
98	32.9	30.8	62.70	.53	2	89.0	57.72	59.1	57.0	99.06	.85	1
99	32.6	30.5	62.70	.52	2	89.0	58.14	59.4	57.3	100.05	.85	1
100	32.3	30.3	62.71	.52	2	89.0	58.57	59.6	57.5	101.04	.85	1
101	32.1	30.0	62.71	.52	2	89.0	59.00	59.8	57.8	102.04	.85	1
102	31.8	29.8	62.72	.51	2	89.0	59.42	60.1	58.0	103.03	.86	1
103	31.6	29.5	62.72	.51	2	89.0	59.85	60.3	58.3	104.02	.86	1
104	31.3	29.3	62.73	.50	2	89.0	60.28	60.6	58.6	105.01	.86	1
105	31.0	29.1	62.73	.50	2	89.1	60.72	60.8	58.8	106.01	.86	1
106	30.8	28.8	62.73	.50	2	89.1	61.15	61.0	59.0	107.00	.86	1
107	30.6	28.6	62.74	.49	2	89.1	61.58	61.3	59.3	107.99	.87	1
108	30.4	28.4	62.74	.49	2	89.1	62.02	61.5	59.5	108.99	.87	1
109	30.1	28.2	62.75	.49	2	89.1	62.45	61.7	59.7	109.98	.87	1
110	29.9	28.0	62.75	.48	2	89.1	62.89	61.9	60.0	110.97	.87	1
111	29.7	27.8	62.75	.48	2	89.1	63.33	62.1	60.2	111.96	.87	1
112	29.4	27.5	62.76	.48	2	89.1	63.77	62.3	60.4	112.96	.88	1
113	29.2	27.3	62.76	.47	2	89.1	64.21	62.5	60.6	113.95	.88	1
114	29.0	27.1	62.76	.47	2	89.1	64.65	62.7	60.9	114.94	.88	1
115	28.8	26.9	62.77	.47	2	89.1	65.09	62.9	61.1	115.94	.88	1
116	28.6	26.7	62.77	.46	2	89.1	65.53	63.1	61.3	116.93	.88	1
117	28.4	26.5	62.77	.46	2	89.1	65.97	63.3	61.5	117.93	.88	1
118	28.2	26.3	62.78	.46	2	89.1	66.42	63.5	61.7	118.92	.89	1
119	28.0	26.2	62.78	.45	2	89.1	66.88	63.7	61.9	119.91	.89	1
120	27.8	26.0	62.78	.45	2	89.1	67.31	63.9	62.1	120.91	.89	1

	PINION					PINION AND GEAR		GEAR				
61 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE, RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
121	27.6	25.8	62.79	.45	2	89.2	67.75	64.1	62.3	121.90	.89	1
122	27.4	25.6	62.79	.45	2	89.2	68.20	64.3	62.5	122.90	.89	1
123	27.2	25.4	62.79	44	2	89.2	68.65	64.5	62.7	123.89	.89	1
124	27.0	25.2	62.79	.44	2	89.2	69.10	64.6	62.9	124.88	.89	1
125	26 8	25.1	62.80	.44	2	89.2	69.54	64.8	63.1	125.88	.90	1
126	26 6	24.9	62 80	.43	2	89.2	70.00	65.0	63.3	126.87	.90	1
127	26.4	24.7	62.80	.43	2	89.2	70.44	65.2	63.4	127.87	.90	1
128	26.3	24.6	62.81	.43	2	89.2	70.89	65.3	63.6	128.86	.90	1
129	26.1	24.4	62.81	.43	2	89.2	71.35	65.5	63.8	129.86	.90	1
130	25 9	24.2	62.81	.42	2	89.2	71.80	65.7	64.0	130.85	.90	1
131	25 7	24.0	62.81	.42	2	89.2	72.25	65.9	64.1	131.85	.90	1
132	25 6	23.9	62.82	.42	2	89.2	72.71	66.0	64.3	132.84	91	1

62 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
62	46.3	43.5	63.41	.70	2	88.7	43.84					
63	45.8	43.0	63.43	.70	2	88.7	4420	46.8	44.0	6440	.71	2
64	45.3	42.6	63.44	.69	2	88.7	44.55	47.2	44.5	65.39	.72	2
65	449	42.2	63.45	.69	2	88.7	4491	47.6	449	66.38	.72	2
66	444	41.8	63.46	.68	2	88.8	4528	48.0	45.4	6737	.73	2
67	44.0	41.3	63.47	.68	2	88.8	4564	48.5	45.8	68.36	.73	2
68	43.6	41.0	63.48	.67	2	88.8	46.01	48.9	46.2	69.35	.74	2
69	43.1	40.5	63.49	.67	2	88.8	46.38	49.3	46.7	70.34	.74	2
70	42.7	40.1	63.50	.66	2	88.8	46.75	49.7	47.1	71.32	.75	2
71	42.3	39.8	63.51	.65	2	88.8	47.13	50.1	47.5	72.31	.75	2
72	41.9	39.4	63.52	.65	2	88.8	47.51	50.5	47.9	73.30	.76	2
73	41.5	39.0	63.53	.64	2	88.8	4789	50.9	48.3	74.29	.76	2
74	41.1	38.6	63.53	.64	2	88.8	48.27	51.2	48.7	75.28	.76	2
75	40.7	38.2	63.54	.63	2	88.8	48.65	51.6	49.1	76.27	.77	2
76	40.3	37.9	63.55	.63	2	88.8	4904	52.0	49.5	77.26	.77	2
77	40.0	37.5	63.56	.62	2	88.8	4943	52.3	49.9	78.25	.78	2
78	39.6	37.2	63.57	.62	2	88.8	4987	52.7	50.2	79.24	.78	2
79	39.2	36.8	63.57	.61	2	88.9	50.21	53.0	50.6	80.23	.78	2
80	38.9	36.5	63.58	.61	2	88.9	50.61	53.4	51.0	81.22	.79	2
81	38.5	36.2	63.59	.60	2	88.9	51.00	53.7	51.3	82.21	.79	2
82	38.2	35.8	63.60	.60	2	88.9	51.40	54.0	51.6	83.20	.80	1
83	37.8	35.5	63.60	.60	2	88.9	51.80	54.3	52.0	84.20	.80	1
84	37.5	35.2	63.61	.59	2	88.9	52.20	54.7	52.3	85.19	.80	1
85	37.1	34.9	63.62	.59	2	88.9	52.60	55.0	52.7	86.18	.81	1
86	36.8	34.6	63.62	.58	2	88.9	53.01	55.3	53.0	87.17	.81	1
87	36.5	34.3	63.63	.58	2	88.9	53.41	55.6	53.3	88.16	.81	1
88	36.2	34.0	63.64	.57	2	88.9	53.82	55.9	53.6	89.15	.82	1
89	35.9	33.7	63.64	.57	2	88.9	54.23	56.2	54.0	90.14	.82	1
90	35.6	33.4	63.65	.56	2	88.9	5464	56.5	54.3	91.13	.82	1
91	35.3	33.1	63.65	.56	2	89.0	55.06	56.8	54.6	92.13	.82	1

62 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
92	35.5	32.8	63.66	.56	2	89.0	55.47	57.1	54.9	93.12	.83	1
93	34.7	32.5	63.67	.55	2	89.0	55.89	57.4	55.2	94.11	.83	1
94	34.4	32.3	63.67	.55	2	89.0	56.30	57.6	55.5	95.10	.83	1
95	34.1	32.0	63.68	.54	2	89.0	56.72	57.9	55.8	96.09	.84	1
96	33.8	31.7	63.68	.54	2	89.0	57.14	58.1	56.0	97.09	.84	1
97	33.5	31.5	63.69	.54	2	89.0	57.56	58.4	56.3	98.08	.84	1
98	33.3	31.2	63.69	.53	2	89.0	57.98	58.7	56.6	99.07	.84	1
99	33.0	31.0	63.70	.53	2	89.0	58.41	58.9	56.9	100.06	.85	1
100	32.7	30.7	63.70	.52	2	89.0	58.83	59.2	57.1	101.05	.85	1
101	32.5	30.5	63.71	.52	2	89.0	59.26	59.4	57.4	102.05	.85	1
102	32.2	30.2	63.71	.52	2	89.0	59.68	59.7	57.6	103.04	.85	1
103	32.0	30.0	63.71	.51	2	89.0	60.11	59.9	57.9	104.03	.85	1
104	31.7	29.7	63.72	.51	2	89.1	60.54	60.1	58.2	105.03	.86	1
105	31.5	29.5	63.72	.51	2	89.1	60.97	60.4	58.4	106.02	.86	1
106	31.2	29.3	63.73	.50	2	89.1	61.40	60.6	58.6	107.01	.86	1
107	31.0	29.0	63.73	.50	2	89.1	61.83	60.8	58.9	108.00	.86	1
108	30.8	28.8	63.73	.50	2	89.1	62.27	61.1	59.1	109.00	.86	1
109	30.5	28.6	63.74	.49	2	89.1	62.70	61.3	59.3	109.99	.87	1
110	30.3	28.4	63.74	.49	2	89.1	63.13	61.5	59.6	110.98	.87	1
111	30.1	28.2	63.75	.49	2	89.1	63.57	61.7	59.8	111.98	.87	1
112	29.8	27.9	63.75	.48	2	89.1	64.01	61.9	60.0	112.97	.87	1
113	29.6	27.7	63.75	.48	2	89.1	64.44	62.1	60.3	113.96	.87	1
114	29.4	27.5	63.76	.48	2	89.1	64.88	62.4	60.5	114.96	.88	1
115	29.2	27.3	63.76	.47	2	89.1	65.32	62.6	60.7	115.95	.88	1
116	29.0	27.1	63.76	.47	2	89.1	65.76	62.8	60.9	116.94	.88	1
117	28.7	26.9	63.77	.47	2	89.1	66.21	63.0	61.1	117.94	.88	1
118	28.5	26.7	63.77	.46	2	89.1	66.65	63.2	61.3	118.93	.88	1
119	28.3	26.5	63.77	.46	2	89.1	67.09	63.4	61.5	119.93	.88	1
120	28.1	26.3	63.78	.46	2	89.1	67.53	63.5	61.7	120.92	.89	1
121	27.9	26.2	63.78	.45	2	89.2	67.98	63.7	61.9	121.91	.89	1

62 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
122	27.7	26.0	63.78	.45	2	89.2	68.42	63.9	62.1	122.91	.89	1
123	27.5	25.8	63.79	.45	2	89.2	68.87	64.1	62.3	123.90	.89	1
124	27.3	25.6	6379	45	2	89.2	69.32	64.3	62.5	124.90	.89	1
125	27.2	25.5	63.79	.44	2	89.2	69.76	64.4	62.7	125.89	.89	1
126	27.0	25.3	63.79	.44	2	89.2	70.21	64.6	62.9	126.88	.89	1
127	26.8	25.1	63.80	.44	2	89.2	70.66	64.8	63.1	127.88	.90	1
128	26.6	24.9	63.80	.43	2	89.2	71.11	65.0	63.3	128.87	.90	1
129	26.4	24.8	63.80	.43	2	89.2	71.56	65.1	63.4	129.87	.90	1
130	26.3	24.6	63.81	.43	2	89.2	72.01	65.3	63.6	130.86	.90	1
131	26.1	24 4	63.81	.43	2	89.2	72.46	65.5	63.8	131.86	.90	1
132	25.9	24 3	63.81	.42	2	89.2	72.92	65.6	64.0	132.85	.90	1

	PINION					PINION AND GEAR		GEAR				
63 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH.* DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
63	46.3	43.5	64.41	.70	2	88.7	44.55					
64	45.8	43.1	64.43	.70	2	88.7	44.90	46.7	44.0	65.40	.71	2
65	45.3	42.6	64.44	.69	2	88.7	45.26	47.2	44.5	66.39	.72	2
66	44.9	42.2	64.45	.69	2	88.7	45.62	47.6	44.9	67.38	.72	2
67	44.4	41.8	64.46	.68	2	88.8	45.98	48.0	45.4	67.37	.73	2
68	44.0	41.4	64.47	.68	2	88.8	46.35	48.4	45.8	69.36	.73	2
69	43.6	41.0	64.48	.67	2	88.8	46.72	48.8	46.2	70.35	.74	2
70	43.2	40.6	64.49	.67	2	88.8	47.09	49.2	46.6	71.34	.74	2
71	42.7	40.2	64.50	.66	2	88.8	47.46	49.6	47.1	72.33	.75	2
72	42.3	39.8	64.51	.66	2	88.8	47.83	50.0	47.5	73.32	75	2
73	41.9	39.4	64.51	.65	2	88.8	48.21	50.4	47.9	74.31	.75	2
74	41.5	39.0	64.52	.65	2	88.8	48.59	50.8	48.3	75.30	.76	2
75	41.2	38.7	64.53	.64	2	88.8	48.97	51.1	48.6	76.28	.76	2
76	40.8	38.3	64.54	.63	2	88.8	49.36	51.5	49.0	77.27	.77	2
77	40.4	38.0	64.55	.63	2	88.8	49.74	51.9	49.4	78.26	.77	2
78	40.0	37.6	64.56	.63	2	88.9	50.13	52.2	49.8	79.26	.78	2
79	39.7	37.3	64.56	.62	2	88.9	50.52	52.7	50.2	80.25	.78	2
80	39.3	36.9	64.57	.62	2	88.9	50.91	53.1	50.5	81.24	.78	2
81	38.9	36.6	64.58	.61	2	88.9	51.31	53.4	50.9	82.23	.79	2
82	38.6	36.3	64.59	.61	2	88.9	51.70	53.7	51.2	83.22	.79	1
83	38.2	36.0	64.59	.60	2	88.9	52.10	54.0	51.6	84.21	.79	1
84	37.9	35.6	64.60	.60	2	88.9	52.50	54.4	51.9	85.20	.80	1
85	37.6	35.3	64.61	.59	2	88.9	52.90	54.7	52.2	86.19	.80	1
86	37.3	35.0	64.61	.59	2	88.9	53.30	55.0	52.6	87.18	.80	1
87	36.9	34.7	64.62	.58	2	88.9	53.71	55.3	52.9	88.17	.81	1
88	36.6	34.4	64.63	.58	2	88.9	54.11	55.6	53.2	89.16	.81	1
89	36.3	34.1	64.63	.58	2	88.9	54.52	55.9	53.5	90.16	.81	1
90	36.0	33.8	64.64	.57	2	89.0	54.93	56.2	53.8	91.15	.82	1
91	35.7	33.5	64.65	.57	2	89.0	55.34	56.5	54.1	92.14	.82	1
92	35.4	33.2	64.65	.56	2	89.0	55.75	56.8	54.4	93.13	.82	1

63 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
93	35.1	33.0	64.66	.56	2	89.0	56.16	57.0	54.7	94.12	.83	1
94	34.8	32.7	64.66	.55	2	89.0	56.58	57.3	55.0	95.11	.83	1
95	34.5	32.4	64.67	.55	2	89.0	56.99	57.6	55.3	96.11	.83	1
96	34.2	32.1	64.67	.55	2	89.0	5741	57.9	55.6	97.10	.83	1
97	34.0	31.9	64.68	.54	2	89.0	57.83	58.1	55.9	98.09	.84	1
98	33.7	31.6	64.68	.54	2	89.0	58.25	58.4	56.2	99.08	.84	1
99	33.4	31.4	64.69	.53	2	89.0	58.67	58.6	56.5	100.07	.84	1
100	33.1	31.1	64.69	.53	2	89.0	59.10	58.9	56.7	101.07	.84	1
101	32.9	30.9	64.70	.53	2	89.0	59.52	59.1	57.0	102.06	.85	1
102	32.6	30.6	64.70	.53	2	89.0	59.94	59.4	57.2	103.05	.85	1
103	32.3	30.4	64.71	.52	2	89.0	6037	59.6	57.5	104.04	.85	1
104	32.1	30.1	64.71	.52	2	89.1	6080	59.9	57.7	105.04	.85	1
105	31.9	29.9	64.72	.51	2	89.1	61.22	60.1	58.0	106.03	.86	1
106	31.6	29.7	64.72	.51	2	89.1	61.65	60.3	58.2	107.02	86	1
107	31.4	29.4	64.72	.51	2	89.1	62.08	60.5	58.5	108.02	.86	1
108	31.1	29.2	64.73	.50	2	89.1	62.52	60.8	58.7	109.01	.86	1
109	30.9	29.0	64.73	.50	2	89.1	62.95	61.0	58.9	110.00	.86	1
110	30.7	28.8	64.74	.50	2	89.1	63.38	61.2	59.2	111.00	.87	1
111	30.5	28.5	64.74	.49	2	89.1	63.81	61.5	59.4	111.99	.87	1
112	30.2	28.3	64.74	.49	2	89.1	64.25	61.7	59.6	112.98	.87	1
113	30.0	28.1	64.75	.48	2	89.1	64.69	61.9	59.9	113.97	.87	1
114	29.8	27.9	64.75	.48	2	89.1	65.12	62.1	60.1	114.97	.87	1
115	29.6	27.7	64.75	.48	2	89.1	65.56	62.3	60.3	115.96	.87	1
116	29.3	27.5	64.76	.48	2	89.1	66.00	62.5	60.5	116.96	.88	1
117	29.1	27.3	64.76	.47	2	89.1	66.44	62.7	60.7	117.95	.88	1
118	28.9	27.1	64.76	.47	2	89.1	66.88	62.9	60.9	118.94	.88	1
119	28.7	26.9	64.77	.47	2	89.1	67.32	63.1	61.2	119.94	.88	1
120	28.5	26.7	64.77	.46	2	89.2	67.76	63.2	61.4	120.93	.88	1
121	28.3	26.5	64.77	.46	2	89.2	68.21	63.4	61.6	121.93	.88	1
122	28.1	26.3	64.78	.46	2	89.2	68.65	63.6	61.8	122.92	.89	1

	PINION					PINION AND GEAR		GEAR				
63 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
123	27.9	26.2	64.78	.45	2	89.2	69.10	63.8	62.0	123.91	.89	1
124	27.7	26.0	64.78	.45	2	89.2	69.54	64.0	62.1	124.91	.89	1
125	27.5	25.8	64.79	.45	2	89.2	69.99	64.2	62.3	125.90	.89	1
126	27.3	25.6	64.79	.45	2	89.2	70.44	64.4	62.5	126.90	.89	1
127	27.1	25.5	64.79	.44	2	89.2	70.88	64.5	62.7	127.89	.89	1
128	27.0	25.3	64.79	.44	2	89.2	71.33	64.7	62.9	128.88	.90	1
129	26.8	25.1	64.80	.44	2	89.2	71.78	64.9	63.1	129.88	.90	1
130	26.6	25.0	64.80	.43	2	89.2	72.23	65.0	63.2	130.87	.90	1
131	26.4	24 8	64.80	.43	2	89.2	72.68	65.2	63.4	131.87	.90	1
132	26.3	24.6	64.80	.43	2	89.2	73.13	65.4	63.6	132.86	.90	1

64 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
64	46.2	43.6	65.41	.70	2	88.7	45.25					
65	45.8	43.1	65.43	.70	2	88.7	45.61	46.7	44.0	66.40	.71	2
66	45.3	42.7	65.44	.69	2	88.8	45.97	47.1	44.5	67.39	.72	2
67	44.9	42.3	65.45	.69	2	88.8	46.33	47.5	44.9	68.38	.72	2
68	44.5	41.9	65.46	.68	2	88.8	46.99	47.9	45.3	69.37	.73	2
69	44.0	41.5	65.47	.68	2	88.8	47.06	48.4	45.8	70.36	.73	2
70	43.6	41.1	65.48	.67	2	88.8	47.42	48.8	46.2	71.35	.74	2
71	43.2	40.7	65.49	.67	2	88.8	47.79	49.2	46.6	72.34	.74	2
72	42.8	40.3	65.50	.66	2	88.8	48.17	49.5	47.0	73.33	.75	2
73	42.4	39.9	65.50	.66	2	88.8	48.54	49.9	47.4	74.32	.75	2
74	42.0	39.5	65.51	.65	2	88.8	48.92	50.3	47.8	75.31	.75	2
75	41.6	39.1	65.52	.65	2	88.8	49.30	50.7	48.2	76.30	.76	2
76	41.2	38.8	65.53	.64	2	88.8	49.68	51.0	48.6	77.29	.76	2
77	40.9	38.4	65.54	.64	2	88.9	50.06	51.4	49.0	78.28	.77	2
78	40.5	38.1	65.55	.63	2	88.9	50.45	51.8	49.3	79.27	.77	2
79	40.1	37.8	65.55	.63	2	88.9	50.84	52.1	49.7	80.26	.77	2
80	39.8	37.4	65.56	.62	2	88.9	51.22	52.4	50.1	81.25	.78	2
81	39.4	37.1	65.57	.62	2	88.9	51.62	52.8	50.4	82.24	.78	2
82	39.0	36.7	65.58	.61	2	88.9	52.01	53.1	50.8	83.23	.79	2
83	38.7	36.4	65.59	.61	2	88.9	52.40	53.4	51.1	84.22	.79	1
84	38.4	36.1	65.59	.60	2	88.9	52.80	53.8	51.5	85.21	.79	1
85	38.0	35.8	65.60	.60	2	88.9	53.20	54.1	51.8	86.20	.80	1
86	37.7	35.5	65.61	.59	2	88.9	53.60	54.4	52.1	87.19	.80	1
87	37.4	35.1	65.61	.59	2	88.9	54.00	54.7	52.5	88.18	.80	1
88	37.0	34.8	65.62	.58	2	88.9	54.41	55.0	52.8	89.17	.81	1
89	36.7	34.5	65.63	.58	2	89.0	54.81	55.3	53.1	90.17	.81	1
90	36.4	34.2	65.63	.58	2	89.0	55.22	55.6	53.4	91.16	.81	1
91	36.1	34.0	65.64	.57	2	89.0	55.63	55.9	53.7	92.15	.82	1
92	35.8	33.7	65.64	.57	2	89.0	56.04	56.2	54.0	93.14	.82	1
93	35.5	33.4	65.65	.56	2	89.0	56.45	56.5	54.3	94.13	.82	1

64 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
94	35.2	33.1	65.65	.56	2	89.0	56.86	56.7	54.6	95.13	.82	1
95	34.9	32.8	65.66	.56	2	89.0	57.27	57.0	54.9	96.12	.83	1
96	34.7	32.6	65.67	.55	2	89.0	57.69	57.3	55.2	97.11	.83	1
97	34.4	32.3	65.67	.55	2	89.0	58.11	57.6	55.5	98.10	.83	1
98	34.1	32.0	65.68	.54	2	89.0	58.52	57.8	55.8	99.09	.84	1
99	33.8	31.8	65.68	.54	2	89.0	58.94	58.1	56.0	100.09	.84	1
100	33.5	31.5	65.69	.54	2	89.0	59.36	58.3	56.3	101.08	.84	1
101	33.3	31.3	65.69	.53	2	89.0	59.78	58.6	56.6	102.07	.84	1
102	33.0	31.0	65.70	.53	2	89.0	60.21	58.8	56.8	103.06	.85	1
103	32.8	30.8	65.70	.53	2	89.1	60.63	59.1	57.1	104.06	.85	1
104	32.5	30.5	65.70	.52	2	89.1	61.06	59.3	57.3	105.05	.85	1
105	32.3	30.3	65.71	.52	2	89.1	61.48	59.6	57.6	106.04	.85	1
106	32.0	30.1	65.71	.52	2	89.1	61.91	59.8	57.8	107.04	.85	1
107	31.8	29.9	65.72	.51	2	89.1	62.34	60.0	58.1	108.03	.86	1
108	31.5	29.6	65.72	.51	2	89.1	62.77	60.3	58.3	109.02	.86	1
109	31.3	29.4	65.73	.50	2	89.1	63.20	60.5	58.5	110.01	.86	1
110	31.1	29.2	65.73	.50	2	89.1	63.63	60.7	58.8	111.01	.86	1
111	30.9	29.0	65.73	.50	2	89.1	64.06	60.9	59.0	112.00	.86	1
112	30.6	28.7	65.74	.49	2	89.1	64.50	61.1	59.2	112.99	.87	1
113	30.4	28.5	65.74	.49	2	89.1	64.93	61.4	59.5	113.99	.87	1
114	30.2	28.3	65.74	.49	2	89.1	65.37	61.6	59.7	114.98	.87	1
115	29.9	28.1	65.75	.48	2	89.1	65.80	61.8	59.9	115.97	.87	1
116	29.7	27.9	65.75	.48	2	89.1	66.24	62.0	60.1	116.97	.87	1
117	29.5	27.7	65.76	.48	2	89.1	66.68	62.2	60.3	117.96	.88	1
118	29.3	27.5	65.76	.47	2	89.1	67.12	62.4	60.6	118.95	.88	1
119	29.1	27.3	65.76	.47	2	89.1	67.56	62.6	60.8	119.95	.88	1
120	28.9	27.1	65.77	.47	2	89.2	68.00	62.8	61.0	120.94	.88	1
121	28.7	26.9	65.77	.47	2	89.2	68.44	63.0	61.2	121.94	.88	1
122	28.5	26.7	65.77	.46	2	89.2	68.88	63.1	61.4	122.93	.88	1
123	28.3	26.5	65.77	.46	2	89.2	69.33	63.3	61.6	123.92	.88	1

64 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
124	28.1	26.4	65.78	.46	2	89.2	69.77	63.5	61.8	124.92	.89	1
125	27.9	26.2	65.78	.45	2	89.2	70.22	63.7	62.0	125.91	.89	1
126	27.7	26.0	65.78	.45	2	89.2	70.66	63.9	62.2	126.91	.89	1
127	27.5	25.8	65.79	.45	2	89.2	71.11	64.1	62.9	127.90	.89	1
128	27.3	25.7	65.79	.45	2	89.2	71.55	64.2	62.6	128.90	.89	1
129	27.2	25.5	65.79	.44	2	89.2	72.00	64.4	62.7	129.89	.89	1
130	27.0	25.3	65.79	.44	2	89.2	72.45	64.6	62.9	130.88	.89	1
131	26.8	25.1	65.80	.44	2	89.2	72.90	64.8	63.1	131.88	.90	1
132	26.6	25.0	65.80	.43	2	89.2	73.35	64.9	63.3	132.87	90	1

	PINION					PINION AND GEAR		GEAR				
65 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
65	46.2	43.6	66.41	.70	2	88.8	45.96					
66	45.8	43.1	66.43	.70	2	88.8	46.32	46.7	44.0	67.40	.71	2
67	45.3	42.7	66.44	.69	2	88.8	46.67	47.1	44.5	68.39	.72	2
68	44.9	42.3	66.45	.69	2	88.8	47.03	47.5	44.9	69.38	.72	2
69	44.5	41.9	66.46	.68	2	88.8	47.40	47.9	45.4	70.37	.73	2
70	44.0	41.5	66.47	.68	2	88.8	47.76	48.3	45.8	71.36	.73	2
71	43.6	41.1	66.48	.67	2	88.8	48.13	48.7	46.2	72.35	.74	2
72	43.2	40.7	66.49	.67	2	88.8	48.50	49.1	46.6	73.34	.74	2
73	42.8	40.3	66.49	.66	2	88.8	48.87	49.5	47.0	74.33	.74	2
74	42.4	40.0	66.50	.66	2	88.8	49.25	49.9	47.4	75.32	.75	2
75	42.0	39.6	66.51	.65	2	88.8	49.62	50.2	47.8	76.31	.75	2
76	41.7	39.2	66.52	.65	2	88.9	50.00	50.6	48.2	77.30	.76	2
77	41.3	38.9	66.53	.64	2	88.9	50.38	51.0	48.6	78.29	.76	2
78	40.9	38.5	66.54	.64	2	88.9	50.77	51.3	48.9	79.28	.77	2
79	40.5	38.2	66.54	.63	2	88.9	51.15	51.7	49.3	80.27	.77	2
80	40.2	37.8	66.55	.63	2	88.9	51.54	52.0	49.7	81.26	.77	2
81	39.8	37.5	66.56	.62	2	88.9	51.93	52.4	50.0	82.25	.78	2
82	39.4	37.1	66.57	.62	2	88.9	52.32	52.7	50.4	83.24	.78	2
83	39.1	36.8	66.58	.61	2	88.9	52.71	53.0	50.7	84.23	.79	1
84	38.8	36.5	66.58	.61	2	88.9	53.11	53.3	51.0	85.22	.79	1
85	38.4	36.2	66.59	.60	2	88.9	53.50	53.7	51.4	86.21	.79	1
86	38.1	35.9	66.60	.60	2	88.9	53.90	54.0	51.7	87.20	.80	1
87	37.8	35.6	66.60	.60	2	88.9	54.30	54.3	52.0	88.20	.80	1
88	37.5	35.3	66.61	.59	2	88.9	54.70	54.6	52.4	89.19	.80	1
89	37.1	35.0	66.62	.59	2	89.0	55.10	54.9	52.7	90.18	.81	1
90	36.8	34.7	66.62	.58	2	89.0	55.51	55.2	53.0	91.17	.81	1
91	36.5	34.4	66.63	.58	2	89.0	55.91	55.5	53.3	92.16	.81	1
92	36.2	34.1	66.64	.57	2	89.0	56.32	55.8	53.6	93.15	.82	1
93	35.9	33.8	66.64	.57	2	89.0	56.73	56.1	53.9	94.15	.82	1
94	35.6	33.5	66.65	.57	2	89.0	57.14	56.4	54.2	95.14	.82	1

65 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
95	35.3	33.2	66.65	.56	2	89.0	57.55	56.6	54.5	96.13	.82	1
96	35.1	33.0	66.66	.56	2	89.0	57.97	56.9	54.8	97.12	.83	1
97	34.8	32.7	66.66	.55	2	89.0	58.38	57.2	55.1	98.11	.83	1
98	34.5	32.4	66.67	.55	2	89.0	58.80	57.4	55.4	99.10	.83	1
99	34.2	32.2	66.67	.55	2	89.0	59.22	57.7	55.6	100.10	.83	1
100	34.0	31.9	66.68	.54	2	89.0	59.63	57.9	55.9	101.09	.84	1
101	33.7	31.7	66.68	.54	2	89.0	60.05	58.2	56.2	102.08	.84	1
102	33.4	31.4	66.69	.54	2	89.0	60.47	58.4	56.5	103.08	.84	1
103	33.2	31.2	66.69	.53	2	89.1	60.90	58.6	56.7	104.07	.84	1
104	32.9	31.0	66.70	.53	2	89.1	61.32	58.9	56.9	105.06	.85	1
105	32.7	30.7	66.70	.52	2	89.1	61.74	59.2	57.2	106.05	.85	1
106	32.4	30.5	66.71	.52	2	89.1	62.17	59.4	57.4	107.05	.85	1
107	32.2	30.2	66.71	.52	2	89.1	62.60	59.6	57.7	108.04	.85	1
108	31.9	30.0	66.71	.51	2	89.1	63.03	59.9	57.9	109.03	.85	1
109	31.7	29.8	66.72	.51	2	89.1	63.45	60.1	58.2	110.03	.86	1
110	31.5	29.5	66.72	.51	2	89.1	63.88	60.3	58.4	111.02	.86	1
111	31.2	29.3	66.73	.50	2	89.1	64.31	60.5	58.7	112.01	.86	1
112	31.0	29.1	66.73	.50	2	89.1	64.75	60.8	58.9	113.01	.86	1
113	30.8	28.9	66.73	.50	2	89.1	65.18	61.0	59.1	114.00	.86	1
114	30.5	28.7	66.74	.49	2	89.1	65.61	61.2	59.3	114.99	.87	1
115	30.3	28.5	66.74	.49	2	89.1	66.05	61.4	59.5	115.99	.87	1
116	30.1	28.3	66.75	.48	2	89.1	66.48	61.6	59.8	116.98	.87	1
117	29.9	28.1	66.75	.48	2	89.1	66.92	61.8	60.0	117.97	.87	1
118	29.7	27.9	66.75	.48	2	89.1	67.36	62.0	60.2	118.97	.87	1
119	29.5	27.7	66.76	.48	2	89.2	67.80	62.2	60.4	119.96	.88	1
120	29.2	27.5	66.76	.47	2	89.2	68.24	62.4	60.6	120.95	.88	1
121	29.0	27.3	66.76	.47	2	89.2	68.68	62.6	60.8	121.95	.88	1
122	28.8	27.1	66.77	.47	2	89.2	69.12	62.8	61.0	122.94	.88	1
123	28.6	26.9	66.77	.47	2	89.2	69.56	63.0	61.2	123.94	.88	1
124	28.4	26.7	66.77	.46	2	89.2	70.00	63.2	61.4	124.93	.88	1

65		PINION				PINION AND GEAR		GEAR				
65 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
125	28.2	26.5	66.77	.46	2	89.2	70.44	63.4	61.6	125.92	.88	1
126	28.1	26.4	66.78	.46	2	89.2	70.89	63.5	61.8	126.92	.89	1
127	27.9	26.2	66.78	.45	2	89.2	71.33	63.7	62.0	127.91	.89	1
128	27.7	26.0	66.78	.45	2	89.2	71.78	63.9	62.2	128.91	.89	1
129	27.5	25.8	66.79	.45	2	89.2	72.22	64.1	62.4	129.90	.89	1
130	27.3	25.7	66.79	.45	2	89.2	72.67	64.2	62.6	130.90	.89	1
131	27.1	25.5	66.79	.44	2	89.2	73.12	64.4	62.7	131.89	.89	1
132	27.0	25.3	66.79	.44	2	89.2	73.57	64.6	62.9	132.88	.89	1

66 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
66	46.2	43.6	67.41	.70	2	88.8	46.67					
67	45.8	43.2	67.43	.70	2	88.8	47.02	46.6	44.0	68.40	.21	2
68	45.3	42.8	67.44	.69	2	88.8	47.38	47.1	44.5	69.39	.22	2
69	44.9	42.4	67.45	.69	2	88.8	47.74	47.5	44.9	70.38	.22	2
70	44.5	42.0	67.46	.68	2	88.8	48.10	47.9	45.4	71.37	.23	2
71	44.0	43.6	67.46	.68	2	88.8	48.47	48.3	45.8	72.36	.23	2
72	43.7	41.2	67.47	.67	2	88.8	48.84	48.7	46.2	73.35	.23	2
73	43.2	40.8	67.48	.67	2	88.8	49.21	49.0	46.6	74.34	.24	2
74	42.8	40.4	67.49	.66	2	88.8	49.58	49.4	47.0	75.33	.24	2
75	42.4	40.0	67.50	.66	2	88.8	49.95	49.8	47.4	76.32	.25	2
76	42.1	39.7	67.51	.65	2	88.9	50.33	50.2	47.8	77.31	.25	2
77	41.7	39.3	67.52	.65	2	88.9	50.71	50.5	48.1	78.30	.26	2
78	41.3	39.0	67.53	.64	2	88.9	51.09	50.9	48.5	79.29	.26	2
79	41.0	38.6	67.54	.64	2	88.9	51.47	51.2	48.9	80.28	.27	2
80	40.6	38.3	67.54	.63	2	88.9	51.85	51.6	49.2	81.27	.27	2
81	40.2	37.9	67.55	.63	2	88.9	52.24	51.9	49.6	82.26	.27	2
82	39.9	37.6	67.56	.62	2	88.9	52.63	52.3	49.9	83.25	.28	2
83	39.5	37.3	67.57	.62	2	88.9	53.02	52.6	50.3	84.24	.28	1
84	39.2	36.9	67.57	.61	2	88.9	53.41	52.9	50.6	85.23	.28	1
85	38.9	36.6	67.58	.61	2	88.9	53.81	53.2	51.0	86.22	.29	1
86	38.5	36.3	67.59	.61	2	88.9	54.20	53.6	51.3	87.22	.29	1
87	38.2	36.0	67.59	60	2	88.9	54.60	53.9	51.6	88.21	.29	1
88	37.9	35.7	67.60	.60	2	89.0	55.00	54.2	52.0	89.20	.30	1
89	37.6	35.4	67.61	.59	2	89.0	55.40	54.5	52.3	90.19	.30	1
90	37.2	35.1	67.61	.59	2	89.0	55.80	54.8	52.6	91.18	.30	1
91	36.9	34.8	66.62	.58	2	89.0	56.21	55.1	52.9	92.17	.31	1
92	36.6	34.5	67.63	.58	2	89.0	56.61	55.4	53.2	93.17	.31	1
93	36.3	34.2	67.63	58	2	89.0	57.02	55.6	53.5	94.16	.31	1
94	36.0	33.9	67.64	.57	2	89.0	57.43	55.9	53.8	95.15	.32	1
95	35.7	33.7	67.64	.57	2	89.0	57.84	66.2	54.1	96.14	.32	1

66 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
96	35.5	33.4	67.65	.56	2	89.0	58.25	56.5	54.4	97.13	.82	1
97	35.2	33.1	67.66	.56	2	89.0	58.66	56.7	54.7	98.12	.83	1
98	34.9	32.9	67.66	.56	2	89.0	59.08	57.0	55.0	99.12	.83	1
99	34.6	32.6	67.67	.55	2	89.0	59.49	57.3	55.2	100.11	.83	1
100	34.3	32.3	67.67	.55	2	89.0	59.91	57.5	55.5	101.10	.83	1
101	34.1	32.1	67.68	.54	2	89.0	60.33	57.8	55.8	102.09	.84	1
102	33.8	31.8	67.68	.54	2	89.1	60.75	58.0	56.0	103.09	.84	1
103	33.6	31.6	67.69	.54	2	89.1	61.17	58.3	56.3	104.08	.84	1
104	33.3	31.3	67.69	.53	2	89.1	61.59	58.5	56.5	105.07	.84	1
105	33.0	31.1	67.69	.53	2	89.1	62.01	58.8	56.8	106.06	.84	1
106	32.8	30.9	67.70	.53	2	89.1	62.43	59.0	57.1	107.06	.85	1
107	32.6	30.6	67.70	.52	2	89.1	62.86	59.2	57.3	108.05	.85	1
108	32.3	30.4	67.71	.52	2	89.1	63.28	59.5	57.5	109.04	.85	1
109	32.1	30.2	67.71	.52	2	89.1	63.71	59.7	57.8	110.04	.85	1
110	31.8	30.0	67.72	.51	2	89.1	64.14	59.9	58.0	111.03	.86	1
111	31.6	29.7	67.72	.51	2	89.1	64.57	60.2	58.3	112.02	.86	1
112	31.4	29.5	67.72	.51	2	89.1	65.00	60.4	58.5	113.02	.86	1
113	31.1	29.3	67.73	.50	2	89.1	65.43	60.6	58.7	114.01	.86	1
114	30.9	29.1	67.73	.50	2	89.1	65.86	60.8	59.0	115.00	.86	1
115	30.7	28.9	67.73	.50	2	89.1	66.30	61.0	59.2	116.00	.86	1
116	30.5	28.6	67.74	.49	2	89.1	66.73	61.2	59.4	116.99	.87	1
117	30.3	28.5	67.74	.49	2	89.1	67.16	61.4	59.6	117.99	.87	1
118	30.0	28.3	67.75	.49	2	89.1	67.60	61.6	59.8	118.98	.87	1
119	29.8	28.1	67.75	.48	2	89.2	68.04	61.8	60.0	119.97	.87	1
120	29.6	27.9	67.75	.48	2	89.2	68.48	62.0	60.3	120.97	.87	1
121	29.4	27.7	67.76	.48	2	89.2	68.92	62.2	60.5	121.96	.88	1
122	29.2	27.5	67.76	.47	2	89.2	69.35	62.4	60.7	122.95	.88	1
123	29.0	27.3	67.76	.47	2	89.2	69.79	62.6	60.9	123.95	.88	1
124	28.8	27.1	67.77	.47	2	89.2	70.24	62.8	61.1	124.94	.88	1
125	28.6	26.9	67.77	.46	2	89.2	70.68	63.0	61.3	125.93	.88	1

66 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE.
126	28.4	26.7	67.77	.46	2	89.2	71.12	63.2	61.5	126.93	.88	1
127	28.2	26.5	67.77	.46	2	89.2	71.56	63.3	61.6	127.92	.88	1
128	28.0	26.4	67.78	.46	2	89.2	72.01	63.5	61.8	128.92	.89	1
129	27.9	26.2	67.78	.45	2	89.2	72.45	63.7	62.0	129.91	.89	1
130	27.7	26.0	67.78	.45	2	89.2	72.90	63.9	62.2	130.91	.89	1
131	27.5	25.8	67.79	.45	2	89.2	73.34	64.1	62.4	131.90	.89	1
132	27.3	25.7	67.79	.45	2	89.2	73.79	64.2	62.6	132.90	.89	1

67 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
67	46.2	43.6	68.41	.70	2	88.8	47.38					
68	45.8	43.2	68.43	.70	2	88.8	47.73	46.6	44.0	69.40	.71	2
69	45.3	42.8	68.44	.69	2	88.8	48.09	47.0	44.5	70.39	.72	2
70	44.9	42.4	68.45	.69	2	88.8	48.45	47.4	44.9	71.38	.72	2
71	44.5	42.0	68.45	.68	2	88.8	48.81	47.8	45.3	72.37	.72	2
72	44.1	41.6	68.46	.68	2	88.8	49.17	48.2	45.7	73.36	.73	2
73	43.7	41.3	68.47	.67	2	88.8	49.54	48.6	46.1	74.35	73	2
74	43.3	40.9	68.48	.67	2	88.8	49.91	49.0	46.5	75.34	.74	2
75	42.9	40.5	68.49	.66	2	88.9	50.28	49.3	46.9	76.33	74	2
76	42.5	40.1	68.50	.66	2	88.9	50.66	49.7	47.3	77.32	.75	2
77	42.1	39.8	68.51	.65	2	88.9	51.03	50.1	47.7	78.31	.75	2
78	41.8	39.4	68.52	.65	2	88.9	51.41	50.4	48.1	79.30	.76	2
79	41.4	39.0	68.53	.64	2	88.9	51.79	50.8	48.4	80.29	.76	2
80	41.0	38.7	68.53	.64	2	88.9	52.17	51.1	48.8	81.28	.76	2
81	40.7	38.4	68.54	.63	2	88.9	52.56	51.5	49.2	82.27	.77	2
82	40.3	38.0	68.55	.63	2	88.9	52.95	51.8	49.5	83.26	.77	2
83	40.0	37.7	68.56	.62	2	88.9	53.33	52.2	49.9	84.25	.78	2
84	39.6	37.4	68.56	.62	2	88.9	53.72	52.5	50.2	85.25	.78	1
85	39.3	37.0	68.57	.62	2	88.9	54.11	52.8	50.6	86.24	.78	1
86	39.0	36.7	68.58	.61	2	88.9	54.51	53.1	50.9	87.23	.79	1
87	38.6	36.4	68.59	.61	2	89.0	54.90	53.4	51.2	88.22	.79	1
88	38.3	36.1	68.59	.60	2	89.0	55.30	53.7	51.5	89.21	.79	1
89	38.0	35.8	68.60	.60	2	89.0	55.70	54.0	51.9	90.20	.80	1
90	37.7	35.5	68.60	.59	2	89.0	56.10	54.3	52.2	91.19	.80	1
91	37.4	35.2	68.61	.59	2	89.0	56.50	54.7	52.5	92.18	.80	1
92	37.0	34.9	68.62	59	2	89.0	56.90	55.0	52.8	93.18	.81	1
93	36.7	34.6	68.62	.58	2	89.0	57.31	55.2	53.1	94.17	.81	1
94	36.4	34.3	68.63	.58	2	89.0	57.72	55.5	53.4	95.16	.81	1
95	36.1	34.1	68.64	.57	2	89.0	58.12	55.8	53.7	96.15	.82	1
96	35.9	33.8	68.64	.57	2	89.0	58.53	56.1	54.0	97.14	.82	1

67 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
97	35.6	33.5	68.65	.57	2	89.0	58.95	56.3	54.3	98.14	.82	1
98	35.3	33.3	68.65	.56	2	89.0	59.36	56.6	54.6	99.13	.82	1
99	35.0	33.0	68.66	.56	2	89.0	59.77	56.9	54.9	100.12	.83	1
100	34.7	32.7	68.66	.55	2	89.0	60.18	57.1	55.1	101.11	.83	1
101	34.5	32.5	68.67	.55	2	89.1	60.60	57.4	55.4	102.11	.83	1
102	34.2	32.2	68.67	.55	2	89.1	61.02	57.6	55.6	103.10	.83	1
103	34.0	32.0	68.68	.54	2	89.1	61.44	57.9	55.9	104.09	.84	1
104	33.7	31.7	68.68	.54	2	89.1	61.86	58.1	56.2	105.08	.84	1
105	33.4	31.5	68.69	.54	2	89.1	62.28	58.4	56.4	106.08	.84	1
106	33.2	31.3	68.69	.53	2	89.1	62.70	58.6	56.7	107.07	.84	1
107	32.9	31.0	68.70	.53	2	89.1	63.12	58.8	56.9	108.06	.85	1
108	32.7	30.8	68.70	.53	2	89.1	63.55	59.1	57.2	109.06	.85	1
109	32.5	30.6	68.70	.52	2	89.1	63.97	59.3	57.4	110.05	.85	1
110	32.2	30.3	68.71	.52	2	89.1	64.40	59.5	57.7	111.04	.85	1
111	32.0	30.1	68.71	.52	2	89.1	64.83	59.8	57.9	112.04	.85	1
112	31.7	29.9	68.72	.51	2	89.1	65.25	60.0	58.1	113.03	.86	1
113	31.5	29.7	68.72	.51	2	89.1	65.68	60.2	58.3	114.02	.86	1
114	31.3	29.5	68.72	.50	2	89.1	66.12	60.4	58.6	115.01	.86	1
115	31.1	29.2	68.73	50	2	89.1	66.55	60.6	58.8	116.01	.86	1
116	30.8	29.0	68.73	.50	2	89.1	66.98	60.9	59.0	117.00	.86	1
117	30.6	28.8	68.74	.50	2	89.1	67.41	61.1	59.3	118.00	.87	1
118	30.4	28.6	68.74	.49	2	89.2	67.85	61.3	59.5	118.99	.87	1
119	30.2	28.4	68.74	.49	2	89.2	68.28	61.5	59.7	119.98	.87	1
120	30.0	28.2	68.75	.49	2	89.2	68.72	61.7	59.9	120.98	.87	1
121	29.8	28.0	68.75	.48	2	89.2	69.15	61.9	60.1	121.97	.87	1
122	29.6	27.8	68.75	.48	2	89.2	69.59	62.1	60.3	122.96	.87	1
123	29.4	27.6	68.76	.48	2	89.2	70.03	62.3	60.5	123.96	.88	1
124	29.2	27.5	68.76	.47	2	89.2	70.47	62.5	60.7	124.95	.88	1
125	29.0	27.3	68.76	.47	2	89.2	70.91	62.6	60.9	125.94	.88	1
126	28.8	27.1	68.77	.47	2	89.2	71.35	62.8	61.1	126.94	.88	1

67 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
127	28.6	26.9	68.77	.46	2	89.2	71.79	63.0	61.3	127.93	.88	1
128	28.4	26.7	68.77	.46	2	89.2	72.24	63.2	61.5	128.93	.88	1
129	28.2	26.5	68.77	.46	2	89.2	72.68	63.3	61.7	129.92	.88	1
130	28.0	26.4	68.78	.46	2	89.2	73.12	63.5	61.9	130.92	.89	1
131	27.8	26.2	68.78	.45	2	89.2	73.57	63.7	62.0	131.91	.89	1
132	27.6	26.0	68.78	.45	2	89.2	74.02	63.9	62.2	132.91	.89	1

	PINION					PINION AND GEAR		GEAR				
68 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
68	46.2	43.6	69.41	.70	2	88.8	48.08					
69	45.7	43.2	69.42	.70	2	88.8	48.44	46.6	44.1	70.40	.71	2
70	45.3	42.8	69.44	.69	2	88.8	48.80	47.0	44.5	71.39	.72	2
71	44.9	42.4	69.44	.69	2	88.8	49.15	47.4	44.9	72.38	.72	2
72	44.5	42.0	69.45	68	2	88.8	49.52	47.8	45.3	73.37	.72	2
73	44.1	41.7	69.46	68	2	88.8	49.88	48.2	45.7	74.36	.72	2
74	43.7	41.3	69.47	67	2	88.9	50.25	48.5	46.1	75.35	.73	2
75	43.3	40.9	69.48	67	2	88.9	50.62	48.9	46.5	76.34	.73	2
76	42.9	40.5	69.49	.66	2	88.9	50.99	49.3	46.9	77.33	.74	2
77	42.5	40.2	69.50	.66	2	88.9	51.36	49.7	47.3	78.32	.74	2
78	42.2	39.8	69.51	.65	2	88.9	51.74	50.0	47.7	79.31	.75	2
79	41.8	39.5	69.52	.65	2	88.9	52.12	50.4	48.0	80.30	.75	2
80	41.4	39.1	69.52	.64	2	88.9	52.50	50.7	48.4	81.29	.76	2
81	41.1	38.8	69.53	.64	2	88.9	52.88	51.0	48.8	82.28	.76	2
82	40.7	38.5	69.54	.64	2	88.9	53.26	51.4	49.1	83.28	.76	2
83	40.4	38.1	69.55	.63	2	88.9	53.65	51.7	49.5	84.27	.77	2
84	40.0	37.8	69.55	.63	2	88.9	54.04	52.0	49.8	85.26	.77	1
85	39.7	37.5	69.56	.62	2	88.9	54.43	52.4	50.1	86.25	.78	1
86	39.3	37.1	69.57	.62	2	89.0	54.82	52.7	50.5	87.24	.78	1
87	39.0	36.8	69.58	.61	2	89.0	55.21	53.0	50.8	88.23	.79	1
88	38.7	36.5	69.58	.61	2	89.0	55.61	53.3	51.1	89.22	.79	1
89	38.4	36.2	69.59	.60	2	89.0	56.00	53.6	51.5	90.21	.79	1
90	38.0	35.9	69.60	.60	2	89.0	56.40	54.0	51.8	91.20	.80	1
91	37.7	35.6	69.60	.60	2	89.0	56.80	54.2	52.1	92.20	.80	1
92	37.4	35.3	69.61	.59	2	89.0	57.20	54.5	52.4	93.19	.80	1
93	37.1	35.0	69.62	.59	2	89.0	57.60	54.8	52.7	94.18	.81	1
94	36.8	34.8	69.62	.58	2	89.0	58.01	55.1	53.0	95.17	.81	1
95	36.5	34.5	69.63	.58	2	89.0	58.41	55.4	53.3	96.16	.81	1
96	36.3	34.2	69.63	.58	2	89.0	58.82	55.7	53.6	97.16	.81	1
97	36.0	33.9	69.64	.57	2	89.0	59.23	55.9	53.9	98.15	.82	1

68 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
98	35.7	33.7	69.65	.57	2	89.0	59.64	56.2	54.2	99.14	.82	1
99	35.4	33.4	69.65	.56	2	89.0	60.05	56.5	54.5	100.13	.82	1
100	35.1	33.1	69.66	.56	2	89.0	60.46	56.7	54.8	101.12	.83	1
101	34.8	32.9	69.66	.56	2	89.1	60.88	57.0	55.0	102.12	.83	1
102	34.6	32.6	69.67	.55	2	89.1	61.29	57.3	55.3	103.11	.83	1
103	34.3	32.4	69.67	.55	2	89.1	61.71	57.5	55.5	104.10	.83	1
104	34.1	32.1	69.68	.54	2	89.1	62.13	57.8	55.8	105.09	.84	1
105	33.8	31.9	69.68	.54	2	89.1	62.55	58.0	56.0	106.09	.84	1
106	33.6	31.7	69.69	.54	2	89.1	62.97	58.2	56.3	107.08	.84	1
107	33.3	31.4	69.69	.53	2	89.1	63.39	58.5	56.5	108.07	.84	1
108	33.1	31.2	69.69	.53	2	89.1	63.81	58.7	56.8	109.07	.84	1
109	32.8	31.0	69.70	.53	2	89.1	64.23	58.9	57.0	110.06	.85	1
110	32.6	30.7	69.70	.52	2	89.1	64.66	59.1	57.3	111.05	.85	1
111	32.3	30.5	69.71	.52	2	89.1	65.09	59.4	57.5	112.05	.85	1
112	32.1	30.3	69.71	.52	2	89.1	65.51	59.6	57.8	113.04	.85	1
113	31.9	30.0	69.71	.51	2	89.1	65.94	59.8	58.0	114.03	.85	1
114	31.7	29.8	69.72	.51	2	89.1	66.37	60.0	58.2	115.03	.86	1
115	31.4	29.6	69.72	.51	2	89.1	66.80	60.3	58.4	116.02	.86	1
116	31.2	29.4	69.73	.50	2	89.1	67.23	60.5	58.7	117.01	.86	1
117	31.0	29.2	69.73	50	2	89.2	67.66	60.7	58.9	118.01	.86	1
118	30.8	29.0	69.73	.50	2	89.2	68.10	60.9	59.1	119.00	.86	1
119	30.6	28.8	69.74	.49	2	89.2	68.53	61.1	59.3	119.99	.87	1
120	30.4	28.6	69.74	.49	2	89.2	68.96	61.3	59.5	120.99	.87	1
121	30.1	28.4	69.74	49	2	89.2	69.40	61.5	59.7	121.98	.87	1
122	29.9	28.2	69.75	.48	2	89.2	69.84	61.7	60.0	122.97	.87	1
123	29.7	28.0	69.75	.48	2	89.2	70.27	61.9	60.1	123.97	.87	1
124	29.5	27.8	69.75	.48	2	89.2	70.71	62.1	60.3	124.96	.87	1
125	29.3	27.6	69.76	.48	2	89.2	71.15	62.3	60.5	125.96	.88	1
126	29.1	27.4	69.76	.47	2	89.2	71.59	62.5	60.7	126.95	.88	1
127	28.9	27.3	69.76	.47	2	89.2	72.03	62.6	60.9	127.94	.88	1

	PINION					PINION AND GEAR		GEAR				
68 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
128	28.7	27.1	69.77	.47	2	89.2	72.47	62.8	61.2	128.94	.88	1
129	28.5	26.9	69.77	.46	2	89.2	72.91	63.0	61.3	129.93	.88	1
130	28.4	26.7	69.77	.46	2	89.2	73.36	63.2	61.5	130.93	.88	1
131	28.2	26.5	69.78	.46	2	89.2	73.80	63.4	61.7	131.92	.89	1
132	28.0	26.4	69.78	.46	2	89.2	74.24	63.5	61.9	132.92	.89	1

	PINION					PINION AND GEAR		GEAR				
69 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
69	46.2	43.7	70.41	.70	2	88.8	48.79					
70	45.7	43.3	70.42	70	2	88.8	49.14	46.6	44.1	71.40	.70	2
71	45.3	42.9	70.43	.69	2	88.8	49.50	47.0	44.5	72.39	.69	2
72	44.9	42.5	70.44	.69	2	88.8	49.86	47.4	44.9	73.38	.69	2
73	44.5	42.1	70.45	.68	2	88.9	50.22	47.8	45.3	74.37	.68	2
74	44.1	41.7	70.46	.68	2	88.9	50.59	48.1	45.7	75.36	.68	2
75	43.7	41.3	70.47	.67	2	88.9	50.95	48.5	46.1	76.35	.67	2
76	43.3	41.0	70.48	.67	2	88.9	51.32	48.9	46.5	77.34	.67	2
77	42.9	40.6	70.49	.66	2	88.9	51.69	49.2	46.9	78.33	.66	2
78	42.5	40.2	70.50	.66	2	88.9	52.07	49.6	47.3	79.32	.66	2
79	42.2	39.9	70.51	.65	2	88.9	52.44	50.0	47.6	80.31	.65	2
80	41.8	39.5	70.52	.65	2	88.9	52.82	50.3	48.0	81.30	.65	2
81	41.5	39.2	70.52	.65	2	88.9	53.20	50.7	48.4	82.30	.65	2
82	41.1	38.9	70.53	.64	2	88.9	53.58	51.0	48.7	83.29	.64	2
83	40.8	38.5	70.54	.64	2	88.9	53.97	51.3	49.1	84.28	.64	2
84	40.4	38.2	70.55	.63	2	88.9	54.35	51.7	49.4	85.27	.63	2
85	40.1	37.9	70.55	.63	2	89.0	54.74	52.0	49.8	86.26	.63	1
86	39.7	37.5	70.56	.62	2	89.0	55.13	52.3	50.1	87.25	.62	1
87	39.4	37.2	70.57	.62	2	89.0	55.52	52.6	50.4	88.24	.62	1
88	39.1	36.9	70.57	.61	2	89.0	55.91	52.9	50.8	89.23	.61	1
89	38.8	36.6	70.58	.61	2	89.0	56.30	53.2	51.1	90.22	.61	1
90	38.4	36.3	70.59	.60	2	89.0	56.70	53.5	51.4	91.22	.61	1
91	38.1	36.0	70.59	.60	2	89.0	57.10	53.8	51.7	92.21	.60	1
92	37.8	35.7	70.60	.60	2	89.0	57.50	54.1	52.0	93.20	.60	1
93	37.5	35.4	70.61	.59	2	89.0	57.90	54.4	52.3	94.19	.59	1
94	37.2	35.2	70.61	.59	2	89.0	58.30	54.7	52.6	95.18	.59	1
95	36.9	34.9	70.62	.58	2	89.0	58.71	55.0	52.9	96.17	.58	1
96	36.6	34.6	70.63	.58	2	89.0	59.11	55.3	53.2	97.17	.58	1
97	36.3	34.3	70.63	.58	2	89.0	59.52	55.5	53.5	98.16	.58	1
98	36.1	34.0	70.64	.57	2	89.0	59.93	55.8	53.8	99.15	.57	1

69 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS, DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH, DIVIDE BY PITCH	BACKING FOR 1 PITCH, DIVIDE BY PITCH	NO. OF CUTTER TO USE
99	35.8	33.8	70.64	.57	2	89.0	60.34	56.1	54.1	100.14	.82	1
100	35.5	33.5	70.65	.57	2	89.1	60.75	56.3	54.4	101.14	.82	1
101	35.2	33.3	70.65	.56	2	89.1	61.16	56.6	54.6	102.13	.82	1
102	35.0	33.0	70.66	.56	2	89.1	61.57	56.9	54.9	103.12	.83	1
103	34.7	32.8	70.66	.55	2	89.1	61.99	57.1	55.1	104.11	.83	1
104	34.4	32.5	70.67	.55	2	89.1	62.40	57.4	55.4	105.11	.83	1
105	34.2	32.3	70.67	.55	2	89.1	62.82	57.6	55.7	106.10	.83	1
106	34.0	32.0	70.68	.54	2	89.1	63.24	57.9	55.9	107.09	.84	1
107	33.7	31.8	70.68	.54	2	89.1	63.66	58.1	56.2	108.08	.84	1
108	33.4	31.6	70.69	.54	2	89.1	64.08	58.3	56.4	109.08	.84	1
109	33.2	31.3	70.69	.53	2	89.1	64.50	58.5	56.7	110.07	.84	1
110	33.0	31.1	70.70	.53	2	89.1	64.92	58.8	56.9	111.06	.85	1
111	32.7	30.9	70.70	.53	2	89.1	65.35	59.0	57.2	112.06	.85	1
112	32.5	30.6	70.70	.52	2	89.1	65.77	59.2	57.4	113.05	.85	1
113	32.2	30.4	70.71	.52	2	89.1	66.20	59.5	57.6	114.04	.85	1
114	32.0	30.2	70.71	.52	2	89.1	66.63	59.7	57.9	115.04	.85	1
115	31.8	30.0	70.72	.51	2	89.1	67.06	59.9	58.1	116.03	.86	1
116	31.6	29.8	70.72	.51	2	89.1	67.48	60.1	58.3	117.02	.86	1
117	31.3	29.6	70.72	.51	2	89.2	67.92	60.3	58.5	118.02	.86	1
118	31.1	29.4	70.73	.50	2	89.2	68.35	60.5	58.7	119.01	.86	1
119	30.9	29.1	70.73	.50	2	89.2	68.78	60.7	59.0	120.00	.86	1
120	30.7	28.9	70.73	.50	2	89.2	69.21	60.9	59.2	121.00	.86	1
121	30.5	28.7	70.74	.49	2	89.2	69.64	61.1	59.4	121.99	.87	1
122	30.3	28.5	70.74	.49	2	89.2	70.08	61.3	59.6	122.99	.87	1
123	30.1	28.3	70.74	.49	2	89.2	70.52	61.5	59.8	123.98	.87	1
124	29.9	28.2	70.75	.48	2	89.2	70.95	61.7	60.0	124.97	.87	1
125	29.7	28.0	70.75	.48	2	89.2	71.39	61.9	60.2	125.97	.87	1
126	29.5	27.8	70.75	.48	2	89.2	71.83	62.1	60.4	126.96	.87	1
127	29.3	27.6	70.76	.48	2	89.2	72.27	62.3	60.6	127.96	.88	1
128	29.1	27.4	70.76	.47	2	89.2	72.71	62.5	60.8	128.95	.88	1

	PINION					PINION AND GEAR		GEAR				
69 TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
129	28.9	27.2	70.76	.47	2	89.2	73.15	62.7	61.0	129.94	.88	1
130	28.7	27.1	70.77	.47	2	89.2	73.59	62.8	61.2	130.94	.88	1
131	28.5	26.9	70.77	.46	2	89.2	74.03	63.0	61.4	131.93	.88	1
132	28.3	26.7	70.77	.46	2	89.2	74.48	63.2	61.6	132.93	.88	1

70 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
70	46.1	43.7	71.41	.70	2	88.8	49.50					
71	45.7	43.3	71.42	.70	2	88.8	49.85	46.6	44.1	72.40	.71	2
72	45.3	42.9	71.43	.69	2	88.9	50.21	47.0	44.5	73.39	.71	2
73	44.9	42.5	71.44	.69	2	88.9	50.57	47.3	44.9	74.38	.72	2
74	44.5	42.1	71.45	.69	2	88.9	50.93	47.7	45.3	75.38	.72	2
75	44.1	41.8	71.46	.68	2	88.9	51.29	48.1	45.7	76.36	.73	2
76	43.7	41.4	71.47	.67	2	88.9	51.66	48.5	46.1	77.35	.73	2
77	43.3	41.0	71.48	.67	2	88.9	52.03	48.8	46.5	78.34	.74	2
78	43.0	41.7	71.49	.66	2	88.9	52.40	49.2	46.9	79.33	.74	2
79	42.6	40.3	71.50	.66	2	88.9	52.77	49.5	47.3	80.32	.75	2
80	42.2	40.0	71.51	.66	2	88.9	53.15	49.9	47.6	81.32	.75	2
81	41.9	39.6	71.51	.65	2	88.9	53.53	50.2	48.0	82.31	.75	2
82	41.5	39.3	71.52	.65	2	88.9	53.91	50.6	48.3	83.30	.76	2
83	41.2	39.0	71.53	.64	2	88.9	54.29	50.9	48.7	84.29	.76	2
84	40.8	38.6	71.54	.64	2	88.9	54.67	51.2	49.0	85.28	.77	2
85	40.5	38.3	71.54	.63	2	89.0	55.05	51.6	49.4	86.27	.77	1
86	40.1	38.0	71.55	.63	2	89.0	55.44	51.9	49.7	87.26	.77	1
87	39.8	37.7	71.56	.62	2	89.0	55.83	52.2	50.0	88.25	.78	1
88	39.5	37.4	71.57	.62	2	89.0	56.22	52.5	50.3	89.24	.78	1
89	39.1	37.0	71.57	.61	2	89.0	56.61	52.8	50.7	90.23	.78	1
90	38.8	36.7	71.58	.61	2	89.0	57.01	53.1	51.0	91.23	.79	1
91	38.5	36.4	71.59	.61	2	89.0	57.40	53.4	51.3	92.22	.79	1
92	38.2	36.1	71.59	.60	2	89.0	57.80	53.7	51.6	93.21	.79	1
93	37.9	35.8	71.60	.60	2	89.0	58.20	54.0	52.0	94.20	.80	1
94	37.6	35.6	71.60	.59	2	89.0	58.60	54.3	52.2	95.19	.80	1
95	37.3	35.3	71.61	.59	2	89.0	59.00	54.6	52.5	96.18	.80	1
96	37.0	35.0	71.62	.59	2	89.0	59.41	54.9	52.8	97.18	.81	1
97	36.7	34.7	71.62	.58	2	89.0	59.81	55.1	53.1	98.17	.81	1
98	36.4	34.5	71.63	.58	2	89.0	60.22	55.4	53.4	99.16	.81	1
99	36.1	34.2	71.64	.57	2	89.1	60.62	55.7	53.7	100.15	.82	1

70 TEETH INTO	PINION					PINION AND GEAR		GEAR				
	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
100	35.9	33.9	71.64	57	2	89.1	61.03	56.0	53.9	101.15	.82	1
101	35.6	33.7	71.65	.57	2	89.1	61.44	56.2	54.2	102.14	82	1
102	35.4	33.4	71.65	.56	2	89.1	61.85	56.5	54.5	103.13	.82	1
103	35.1	33.2	71.66	.56	2	89.1	62.27	56.7	54.8	104.12	83	1
104	34.8	32.9	71.66	.56	2	89.1	62.68	57.0	55.0	105.12	.83	1
105	34.6	32.7	71.67	.55	2	89.1	63.10	57.2	55.3	106.11	.83	1
106	34.3	32.4	71.67	.55	2	89.1	63.51	57.5	55.5	107.10	.83	1
107	34.1	32.2	71.68	.54	2	89.1	63.93	57.7	55.8	108.09	.84	1
108	33.8	31.9	71.68	.54	2	89.1	64.35	58.0	56.0	109.09	.84	1
109	33.6	31.7	71.68	.54	2	89.1	64.77	58.2	56.3	110.08	.84	1
110	33.3	31.5	71.69	.53	2	89.1	65.19	58.4	56.5	111.07	.84	1
111	33.1	31.3	71.69	.53	2	89.1	65.61	58.6	56.8	112.07	.84	1
112	32.8	31.0	71.70	.53	2	89.1	66.04	58.9	57.0	113.06	85	1
113	32.6	30.8	71.70	.52	2	89.1	66.46	59.1	57.3	114.05	.85	1
114	32.4	30.6	71.71	.52	2	89.1	66.89	59.3	57.5	115.05	.85	1
115	32.1	30.4	71.71	.52	2	89.1	67.31	59.5	57.7	116.04	.85	1
116	31.9	30.1	71.71	.52	2	89.2	67.74	59.7	57.9	117.04	.85	1
117	31.7	29.9	71.72	.51	2	89.2	68.17	59.0	58.2	118.03	.86	1
118	31.5	29.7	71.72	.51	2	89.2	68.60	60.2	58.4	119.02	.86	1
119	31.3	29.5	71.72	.51	2	89.2	69.03	60.4	58.6	120.02	.86	1
120	31.1	29.3	71.73	.50	2	89.2	69.46	60.6	58.8	121.01	.86	1
121	30.9	29.1	71.73	.50	2	89.2	69.90	60.8	59.0	122.00	.86	1
122	30.6	28.9	71.74	.50	2	89.2	70.33	61.0	59.2	123.00	.87	1
123	30.4	28.7	71.74	.49	2	89.2	70.76	61.2	59.4	123.99	.87	1
124	30.2	28.5	71.74	.49	2	89.2	71.19	61.4	59.6	124.99	.87	1
125	30.0	28.3	71.75	.49	2	89.2	71.63	61.6	59.8	125.98	.87	1
126	29.8	28.1	71.75	.48	2	89.2	72.07	61.8	60.0	126.97	.87	1
127	29.6	28.0	71.75	.48	2	89.2	72.50	61.9	60.2	127.97	.87	1
128	29.4	27.8	71.76	.48	2	89.2	72.94	62.1	60.4	128.96	.88	1
129	29.2	27.6	71.76	.47	2	89.2	73.38	62.3	60.6	129.95	.88	1

70	PINION					PINION AND GEAR		GEAR				
TEETH INTO	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE	BACK ANGLE	PITCH CONE RADIUS. DIVIDE BY PITCH	FACE ANGLE	CUTTING ANGLE	OUTSIDE DIAM. FOR 1 PITCH. DIVIDE BY PITCH	BACKING FOR 1 PITCH. DIVIDE BY PITCH	NO. OF CUTTER TO USE
130	29.0	27.4	71.76	.47	2	89.2	73.82	62.5	60.8	130.95	.88	/
131	28.9	27.2	71.76	.47	2	89.2	74.26	62.7	61.0	131.94	.88	/
132	28.7	27.0	71.77	.47	2	89.2	74.71	62.9	61.2	132.94	.88	/

HANDY TABLE OF DECIMAL EQUIVALENTS

1/64 = .01563	17/64 = .26563	33/64 = .51563	49/64 = .76563
1/32 = .03125	9/32 = .28125	17/32 = .53125	25/32 = .78125
3/64 = .04688	19/64 = .29688	35/64 = .54688	51/64 = .79688
1/16 = .0625	5/16 = .3125	9/16 = .5625	13/16 = .8125
5/64 = .07813	21/64 = .32813	37/64 = .57813	53/64 = 82813
3/32 = .09375	11/32 = .34375	19/32 = .59375	27/32 = .84375
7/64 = .10938	23/64 = .35938	39/64 = .60938	55/64 = .85938
1/8 = .125	3/8 = .375	5/8 = .625	7/8 = .875
9/64 = .14063	25/64 = .39063	41/64 = .64063	57/64 = .89063
5/32 = .15625	13/32 = .40625	21/32 = .65625	29/32 = .90625
11/64 = .17188	27/64 = .42188	43/64 = .67188	59/64 = .92188
3/16 = .1875	7/16 = .4375	11/16 = .6875	15/16 = .9375
13/64 = .20313	29/64 = .45313	45/64 = .70313	61/64 = .95313
7/32 = .21875	15/32 = .46875	23/32 = .71875	31/32 = .96875
15/64 = .23438	31/64 = .48438	47/64 = .73438	63/64 = .98438
1/4 = .25	1/2 = .5	3/4 = .75	1 = 1.0000

[illegible]

[illegible] ✓

JM
JOSEPH
MACH
PRINTING
HOUSE
LIMITED.

pencil
Use of red ✓

89089666481

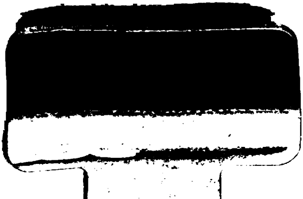
B89089666481A

89088930870

b89088930870a

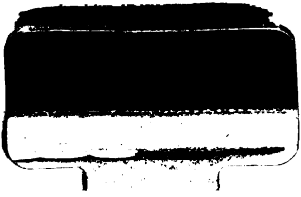
89088930870

b89088930870a



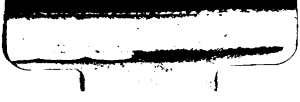
89088930870

b89088930870a



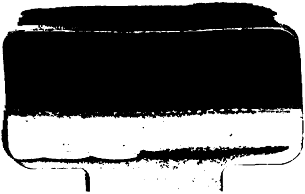
89088930870

b89088930870a



89088930870

b89088930870a



89088930870

B89088930870A